the FACTS

All the information you need, straight from the experts

# ADHD

Mark Selikowitz

3 THIRD EDITION

OXFORD

the**facts**

# ADHD

THIRD EDITION

**MARK SELIKOWITZ**
Consultant Developmental Paediatrician
Sydney, Australia

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS
Great Clarendon Street, Oxford, OX2 6DP,
United Kingdom



First Edition published in 2004
Second Edition published in 2009
Third Edition published 2021
Impression: 1



Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America

Library of Congress Control Number: 2021935952

ISBN 978–0–19–886737–1
eISBN 978–0–19–263729–1

DOI: 10.1093/oso/9780198867371.001.0001

# Preface to third edition

Twelve years have passed since the second edition of this book was published; years that have seen many positive changes in the recognition, acceptance, management, and understanding of attention-deficit/hyperactivity disorder (ADHD).

One significant change has been the greater recognition of ADHD in adulthood. This has meant that children with ADHD are now able to continue receiving treatment for their condition, if required, after they have reached adulthood. It has also meant that many adults whose ADHD was not diagnosed when they were younger are now, for the first time, able to understand the nature of the disorder that has caused their lifelong difficulties, and to benefit from having it appropriately treated.

Another positive development has been that many governments in Western countries have accepted that ADHD is a bona fide medical condition and now subsidize the medications used to treat the condition and provide funding to support individuals with ADHD during their school and tertiary education.

Yet another improvement is that the media are now less likely to publish negative articles or to produce negative TV programmes casting doubt on the existence of ADHD, or the treatment of the condition with medication. Articles and programmes on ADHD now generally relate success stories about children and adults with ADHD who have benefited from the correct diagnosis and treatment of their condition or, importantly, highlight unmet needs of children and adults with the condition.

On the medical front, several new medications have become available to treat ADHD. In addition, some of the older medications have been modified so that their effect lasts longer, thereby avoiding the need to take medication more than once daily. There has also been an enormous increase in research into ADHD. In 2019 alone, 2,364 research papers on ADHD were published in the scientific and biomedical literature.

The text in this third edition has been updated to reflect these and other new developments. It is gratifying that nothing in the preceding edition needed to be retracted. As before, the book reflects a

conservative and balanced approach based on my long experience of treating many children and adults with ADHD—an approach that has stood the test of time.

MS
Sydney
April 2021

## Preface to second edition

In this second edition the text has been updated, as required, to include new developments, but it was gratifying that nothing in the first edition needed to be retracted. Research has only confirmed and expanded what we believed five years ago. Particularly pleasing has been the ability to include a greater range of treatment options for children and adults with attention-deficit/hyperactivity disorder (ADHD).

The new edition has also been an opportunity to make the text more accessible to its readers, with the inclusion of key points at the beginning of each chapter and the revision of the text to make it more reader friendly. This is particularly important in a book about ADHD, as many of its readers have attention and learning difficulties that make absorption of written text challenging.

I have endeavoured, as before, to provide balanced information so that readers can make informed choices.

MS
Sydney
January 2009

# Preface to first edition

Awareness of attention-deficit/hyperactivity disorder (ADHD) has been growing among both parents and professionals over the past decade. Television programmes and newspaper and magazine articles increasingly deal with this common and important condition.

Despite this media coverage, ignorance about ADHD is widespread. This book aims to help overcome such ignorance. It provides a practical overview of ADHD for all those who, in the broadest sense of the term, care for children. It will interest parents, teachers, doctors, and psychologists. It will also be of interest to the many other professionals, such as speech therapists and occupational therapists, who come into regular contact with children who struggle to learn, or have difficulty behaving appropriately for their age.

But if this book merely provides information, it will only partially have fulfilled its purpose. If children with ADHD and their parents are to be helped, knowledge alone will not suffice; it is essential that attitudes to children with this 'hidden handicap' change.

It is, therefore, my hope that this book will lead its readers to a reappraisal of the way we interpret the developmental difficulties that so many children in our community face. It is hoped that we will banish useless words, such as 'lazy', 'stupid', and 'naughty', in favour of alternatives that lead us to a deeper understanding of these children, of the difficulties they contend with, and of their special needs. We will also have to appreciate how stressful such children can be to live with, so that we can provide their parents with the support they need.

Section 1 and Sections 3–7 of the book cover ADHD in a general way. These sections will interest all parents.

In Section 2, each of the eight chapters is devoted to a specific area of development, and parents can select those chapters that are relevant to their child's particular difficulties.

To avoid using the cumbersome 'he or she' when referring to the child with ADHD, I have used 'he' in some sections and 'she' in others. All statements apply equally to both sexes unless otherwise specified.

I am grateful to the parents of Martine, David, and Peter who let me quote from their stories.

I am indebted to my friend and colleague, Dr Rory McCarthy, with whom I share the approach to the diagnosis and management of ADHD that is reflected in this text. The book has benefited from the regular exchange of ideas that working with Rory makes possible.

Finally, I thank my wife, Jill, who proofread the first draft of the typescript and made many valuable comments and suggestions. Her perspective as a teacher and a parent has been of great value. This book is dedicated to her, and to my children, Daniel and Anne, with love.

# Contents

SECTION 1

# Introduction

# 1

# What is ADHD?

Key points

- ADHD is not a new disorder. It was first described in 1902.
- It is one of the most common conditions in childhood, affecting as many as 5% of school-aged children and 3% of adults.
- It occurs in two very different forms: one that is mainly a learning difficulty and another that mainly affects behaviour.

## A tale of two children

**Dear Doctor**

Martine is now 13 years old and we are concerned about her school progress. She is well-behaved and does not get into any trouble at school, or at home, and this is why we have left it so long before seeking help.

Martine's reports have always been full of comments such as 'Martine needs to concentrate more'; 'Martine has good potential if she were not so easily distracted'.

Martine is a vague, dreamy sort of child. Often when you talk to her, she seems to be in a world of her own. One teacher thought she may be hard of hearing, but we had this tested and her hearing is perfect.

When you give her an instruction with more than three parts, she loses track of what she has to do. Yesterday I asked her to go to her room and take the sheets off her bed and put them in the wash. Ten minutes later I went to her room to find her sitting on her bed. She genuinely did not remember what I had asked her to do.

Her memory seems so inconsistent. She can tell you in detail about what happened years ago. Last week she surprised us by

recognizing someone in a photo whom she had not seen for years —and telling us all about her visit to this person's house very accurately. Yet today she cannot remember the spelling list she knew yesterday.

She is terribly disorganized. She is always losing things. She has to phone her friend most afternoons to find out what homework she is supposed to do.

She is also clumsy. She is a terrible fidget—some bit of her is always squirming when she should be sitting still.

But her greatest difficulty is in concentrating on schoolwork. She sits down to her homework with the best of intentions, but she can't seem to persist with it. She is up and down at her desk and unless I sit with her nothing gets done. Even then it is a constant battle, so that the whole family is upset. Getting her to complete assignments for school is impossible unless I do almost the whole thing for her. Her poor concentration is a problem at school as well. Her teachers complain that, when all the other children have their eyes glued to their work, Martine is gazing out the window. Her work is often incomplete.

Martine says that she would like to become a teacher when she is an adult. We feel she is a clever girl but, if she continues like this, we can't see her achieving anything. Do you think you could help her?

**Dear Doctor**

I am writing this letter to you before the appointment because I always find it difficult to remember what I wanted to say when I am sitting in front of a doctor.

We are desperate about David (aged 7 years)—you are our last resort! We have been to numerous doctors, psychologists, and psychiatrists already. They all make us feel that we are the cause of David's problem. We are tired of being analysed—we just want help.

David has been difficult from the moment he was born. The first two of our children were easy babies, but David was irritable from the very beginning. He hardly slept as an infant. He walked earlier than our other two, and from the time he took his first steps, at 9 months, he has been on the go. As a toddler he was into everything and had to be watched all the time. We tried him on a

‘hyperactivity diet’, but it did not help. Now that he is older, he is not as active, but he still never seems to tire, except when he is sick. I feel guilty admitting that it is only when he is ill that I enjoy having him at home.

He is like a walking disaster. He takes risks all the time; he has broken his leg twice and has numerous scars. He acts without stopping to think of the consequences, and he never seems to learn from his mistakes.

He won’t do as he is told and if we try to discipline him, he becomes abusive and even aggressive. We have tried ‘timeout’ (putting him in his room, when disobedient, to cool down), but he destroys his room so it is just not worth it. On two occasions he jumped out of his bedroom window and ran away.

Living with David is like walking on eggshells. The slightest frustration sets him off into a rage. But sometimes he will be aggressive for no apparent reason. For example, yesterday his brother was sitting watching television and David came into the room, walked up to him and kicked him—out of the blue! He seemed sorry after he had done it, but I can’t understand why he does things like that.

Each morning I wake up and get out of bed with a feeling of trepidation waiting to see what kind of a mood he is in, and what sort of a day we can expect. But even if he is in a good mood, it can change quite suddenly as the least thing sets him off.

School has been a disaster for David. After the first week his teacher called me in to tell me he was impossible to teach. He wanders about the classroom; he calls out in class; he is noisy and he disrupts other children; his books are terribly messy; his work is never completed. The worst thing is that he is very rude to the teachers. He is easily affronted and takes any attempt to discipline him as a personal insult. He always seems to be getting punished, but it does not help. Earlier this term he was suspended from school for a week for swearing at a teacher. I had to take time off work to stay with him, but I think he actually enjoyed the punishment.

He does not get on with the other children in the playground. He is very bossy with them and is not prepared to compromise. He has now earned a reputation as a bully, and is ostracized by the other children. He seems to get into punch-ups every day. I am sure he starts most of these. He will take on children who are older and larger than himself, so he often comes off second-best. He was

suspended from school for a week last term for punching a boy. The punishment made no difference to David—he was in a fight on his first day back!

I don't want you to think that David is always bad. He can be sweet and loving, and often he shows he is genuinely sorry for what he has done. But it never lasts for long—with David, trouble is always around the corner. Most worrying to us now is that David seems to be becoming depressed about his difficulties. Over the last month he has started saying that he is 'dumb'. He often says, 'Mummy, I don't know what is wrong with me'. Twice he has said that he wants to kill himself. We are terribly worried.

Martine and David both came to see me. My assessments showed that they both had attention-deficit/hyperactivity disorder (ADHD) and they were both greatly helped by treatment for this condition.

Martine has the form called the 'inattentive' type of ADHD,[1] while David has the form we call the 'combined' type of ADHD. The conditions are very different, yet they are related to one another. They are like two sides of the same coin. The profiles of the two types are outlined in Table 1.1.

**Table 1.1** Profiles of the two types of ADHD

| | **Inattentive type** | **Combined type** |
|---|---|---|
| **Age of diagnosis:** | Later (primary or high school) | Earlier (nursery or primary school) |
| **Boy to girl ratio:** | Boys and girls in equal numbers | Boys outnumber girls |
| **Major difficulty:** | Academic performance | Behaviour |
| **Common descriptions:** | 'Quiet underachiever' 'Dreamy' | 'Acts without thinking' 'Can't sit still' |

There is a third form, known as the 'hyperactive-impulsive' type. It is characterized by hyperactivity and/or impulsivity without discernible inattention. This is a diagnosis made exclusively in children under five years of age who are at a stage in life when concentration difficulties are difficult to assess. Invariably, once they enter school, children with this form of ADHD are found to have difficulties with

attention. It is therefore just an early form of the combined type and will not be discussed further.

None of these three forms of the condition is the fault of the parents. Rather, each condition is the result of insufficient quantities of certain chemical messengers in the child's brain. The medicines used to treat all types of ADHD act by increasing the levels of these chemical messengers closer to normal, which enables the child to learn and behave like other children. Careful diagnosis is essential to be certain that the child's difficulties are caused by ADHD, and not by some other problem, which may require a different treatment.

The diagnosis, causes, and treatment of ADHD are discussed in the following chapters.

## Overview of the features of ADHD

All children with ADHD have some features of the condition; few have all. While some children with the combined form of ADHD have hyperactivity and impulsivity, some have only hyperactivity, while others have only impulsivity.

The features of all types of ADHD are listed in Table 1.2 and are discussed in this chapter. It should be noted that a child without ADHD might have some of the features described here, but a child with ADHD experiences significantly greater difficulties in affected areas of development than the average child of the same age.

**Table 1.2** Features of ADHD

| Inattentive type | Combined type | May be present in either type (both types) |
|---|---|---|
| Poor concentration | Poor concentration | Performance inconsistency |
| Task impersistence | Task impersistence | Low self-esteem |
| Disorganization | Disorganization | Poor working memory |
| Forgetfulness | Forgetfulness | Poor incentival motivation |
| | Impulsivity | Social clumsiness |
| | Overactivity | Learning difficulties |
| | Noisiness | Poor coordination |
| | | Inflexibility |
| | | Insatiability |
| | | Defiant behaviour |
| | | Sleep problems |

## Features of the inattentive type of ADHD

### Poor concentration

Children with ADHD cannot concentrate with the same ease as other children of the same age. The attentional mechanisms in their brains are inefficient. This means that they have great difficulty concentrating on tedious tasks, such as schoolwork, which greatly test these mechanisms. Their work often contains many careless errors and shows lack of precision and attention to detail.

These children have particular difficulties maintaining attention in a setting where there are many distractions, e.g. a classroom. They do better in a one-to-one situation.

Children with ADHD usually have far greater difficulty concentrating on things they must *listen* to, rather than things they must *look* at. Their difficulty listening may be so acute that they appear to have a hearing problem.

In milder cases, children will be able to maintain attention for highly motivating and interactive activities, such as video games, and may be able to concentrate on tedious tasks, such as schoolwork, for short periods. However, their inefficient concentrating mechanisms soon fatigue and their attention falters. The work of such children may be full of good beginnings and poor endings. They may be able to manage relatively well in the first part of the school day, but their performance usually falls off markedly in the second half. When they return from school, they may be very tired and emotionally drained from the great effort of focusing in class.

Concentrating on schoolwork may require so much effort from the child that he may be unusually reluctant to start work. When they have work assignments, homework, or revision to do, such children procrastinate far more than their peers.

Children with severe ADHD may have difficulty staying on any task for very long and may be unable to sit and watch a movie or play a game they enjoy. These children may constantly flit from one activity to another.

Poor concentration in children with ADHD is described in more detail in Chapter 2.

## Task impersistence

A common complaint regarding children with ADHD is that they do not complete tasks.

At home, parents find that they need to supervise their children more closely than the parents of children of the same age. Simple chores, like getting dressed in the morning, take a long time. Parents often report that ‘Nothing would get done if I were not on my child’s back all the time’.

These children often forget what they are asked to do. Their parents may find them staring into space or doing something quite different.

Impersistence is a particular problem with schoolwork, as children with ADHD often do not finish their set work. They may gaze out of the window, do something else, or start disrupting other children. As they get into high school and examinations become more important, this impersistence can seriously affect academic results, as children with ADHD may not complete their examination papers within the allocated time.

## Disorganization

Children with ADHD find it very difficult to follow sequences without a great deal of supervision. When such supervision is not available, they become muddled and disorganized.

### Forgetfulness

'An excellent memory for what happened last year, but he cannot remember what happened yesterday' is a common description of the child with ADHD. Many know their multiplication or spelling list immediately after it has been taught but cannot recall it the next day. Surprisingly, they often remember in great detail events that happened a long time ago.

Such children may have difficulty following an instruction with more than one part, becoming distracted or lost midway through carrying it out. They are often very absent-minded—homework is forgotten at school, pens are misplaced, and possessions lost.

## Features of the combined type of ADHD

Children with the combined type have all the features present in the inattentive type *combined* with impulsivity and/or hyperactivity.

### Impulsivity

Children with the impulsive type of ADHD have great difficulty stopping to think before they act. As Dennis the Menace said, 'By the time I think about it, I have done it!' Children with this form of ADHD often do the first thing that comes into their heads: they will blurt out answers in class; they may say tactless things; they may take many risks; they have tremendous difficulty waiting their turn. They are the sort of children who may run out in front of a car without looking first.

Because of this impulsivity they do not learn from their mistakes. The problem is not necessarily that children with ADHD do not know the correct thing to do. They will often be able to explain in great detail what they should have done. They may also be quick to notice when others break the rules that they themselves do not obey. Nor is the problem that they do not want to do the right thing. They may be very upset and apologetic after the event. Their difficulty is in their lack of self-control.

The mechanisms that control behaviour in the brain seem to be unreliable in the child with ADHD. ADHD is a problem of performance, not of knowledge. As Dr. Russell Barclay, one of the

foremost experts on this condition, put it: 'ADHD is not a matter of not knowing what to do, but of not being able to do what you know'.

Impulsivity in children with ADHD is discussed further in Chapter 3.

### Overactivity (Hyperactivity)

Some children with ADHD are continually on the go. They may be so restless as to seem to be 'driven by a motor'. Such a child often cannot remain seated, even for a few moments. He may wander around the classroom and the teacher may have great difficulty keeping him on his seat. Even when seated, some part of him may always be squirming.

In the past, such overactivity (or 'hyperactivity') was considered an essential feature of ADHD. We now know that, while most children with ADHD are more fidgety or restless than other children when carefully observed, many children with ADHD are not overactive.

Even those who are highly active when young may become less active than their peers as they get older—a transformation that has been described as changing from being a 'flipper' to a 'flopper' (in the sense of continually flopping down in front of the TV).

Overactivity in ADHD is discussed in Chapter 4.

### Noisiness

Children with the combined type of ADHD are often boisterous and loud. They find it difficult to engage in activities quietly. Some talk excessively, driving other family members to distraction.

Some children have a habit of making all manner of repetitive noises that sound like an animal or a motor. They may be quiet for a short time if reprimanded, but the noises return, often without the child being aware that he is making them.

## Features that may be present in either type of ADHD

### Performance inconsistency

All children show some inconsistency in their performance, but this is particularly marked in children with ADHD. With a tremendous amount of effort, children with ADHD can sometimes concentrate or manage to stop and think before acting like other children, but they cannot maintain this effort most of the time.

It is this performance inconsistency that has so confused observers and led to many children with ADHD being labelled as 'lazy' or 'naughty'. Those who do not understand the nature of ADHD think that, because a child performs appropriately on certain occasions, he is simply not trying hard enough when he fails. In the words of one psychiatrist: 'A child with ADHD does well once and we hold that against him for the rest of his school career!'

Some situations make it easier for the child with ADHD. The child may do well with close supervision in a one-to-one setting, in a novel situation, or with someone of whom he or she is afraid. Even in these situations, improved performance will not last and the old difficulties resurface.

## Low self-esteem

Children with ADHD are very hard on themselves. They may say negative things about themselves such as 'I am dumb'. They may cry easily and be easily offended. They may feel dissatisfied with themselves even when they succeed. For example, a child with ADHD who hit a cricket ball with great power complained that his father had bowled it too 'softly' to him. Some children with ADHD who have low self-esteem may hide this behind bravado, bragging about themselves and putting down others as a way of managing their inferiority complex.

Poor self-esteem in ADHD and the different types of behaviour it may give rise to are discussed in Chapter 7.

## Poor working memory

The memory difficulties of children with ADHD are not confined to the forgetfulness described earlier in this chapter. A type of short-term memory known as 'working memory' may also be impaired in children with ADHD.

The brain's working memory holds thoughts like a series of pictures pinned on a board, or a plan sketched on a notepad. These can be referred to in order to aid understanding and to guide decision making.

A child with ADHD who has a poor working memory will experience great difficulty keeping any set of instructions or sequenced information in his mind. He will, therefore, find it difficult to plan ahead. He will also have trouble following the plot when reading a book, or even when writing a story of his own.

Many of the learning difficulties experienced by children with ADHD that affect skills such as reading comprehension, sequencing, and written expression are due to impairments in working memory.

In addition, some of the behavioural problems seen in this condition, such as lack of foresight and failure to learn from experience, are also due, in part, to problems with working memory. Poor working memory makes it difficult for the child to guide his behaviour by *self-talk*—the inner monologue that we use to keep us on track.

## Poor incentival motivation

*Incentival motivation* refers to the ability to work for future rewards. As children grow older, they must defer gratification and be prepared to work for some future reward. Children with ADHD find it very difficult to sacrifice for a deferred reward, a characteristic sometimes referred to as *future discounting* or *pure time preference*. For example, they find it difficult to put in regular hours of study for something as intangible as good marks on a report card at the end of the year. They are easily diverted from such study by the immediate gratification offered by watching TV or playing video games. This difficulty is a fundamental problem for many children with ADHD.

## Social clumsiness

Children with ADHD often experience problems 'reading' social situations. They are often 'socially tone deaf'. Unintentionally, they often say tactless things without realizing the effect these statements may have on others. They seem to have difficulty predicting the consequences of their actions and responding appropriately to the occasion. They may 'come on too strong' in social settings. These children often do not pick up the same cues as other children of the same age. They often do not read facial expressions and may be oblivious to whether someone is angry or upset with them. Because they fail to develop the same degree of reserve as normal children, they may behave in front of others in ways that are not appropriate for children their age.

Although such abnormal behaviour may be apparent to all who meet the child, the people who are most likely to notice are the child's peers. With them, the child with ADHD often sticks out like a sore thumb. Typically, such children have little or no insight into how differently they are perceived. They do not seem to be able to learn the skills that are required to mix with others. They often become loners or play with children younger or older than themselves. With

younger children, they blend in because of their immaturity. With older children, more allowances are made for their inappropriate behaviour.

Social clumsiness in children with ADHD is further described in Chapter 8.

## Learning difficulties

All children with ADHD underachieve academically. Most children with ADHD will have difficulties in primary school with skills such as reading, spelling, and mathematics. Many have very untidy handwriting. Other common areas of difficulty are in reading comprehension and written expression.

Some children with mild ADHD may do well during primary school. However, during high school such children often start to fall behind, as greater skills in concentration and organization are required.

Learning difficulties in ADHD are described in Chapter 5.

## Poor coordination (clumsiness)

While some children with ADHD are excellent athletes, most are poorly coordinated. Catching a small ball and writing neatly are skills that many children with ADHD find extremely difficult. Many have low muscle tone (slight floppiness) when younger and have a poorly coordinated running style.

## Inflexibility

Children with ADHD are often very literal, and 'black and white' in their understanding of the world around them. They find it difficult to compromise. As a result, parents find themselves in conflict with their child over many issues.

'Every discussion is an argument' is a phrase parents often use to describe their child's behaviour. Once the child with ADHD takes up an attitude to something, it is often almost impossible to get him or her to change. Children with ADHD may become fixated on certain rules and follow these rigidly. They have difficulty understanding when such rules can be reasonably bent.

## Insatiability

Children with ADHD may be insatiable in their activities and may not know when to stop the way another child of their age would. This is

observed when they become overexcited in play and cannot calm down when it is time to be serious. Instead, they become more and more excited and noncompliant. They may even become excessively defiant and provocative despite reasonable requests to calm down.

They may show their insatiability by being unsatisfied with any treat and by nagging for more and more things they want. This difficulty is related to problems that these children have with delaying gratification—they find it extremely difficult to wait for a reward or treat. Many parents find this insatiability the hardest part of ADHD to manage; they are worn down by their child's constant nagging, which can last for hours, or even days, on end.

### Defiant behaviour

Many children with ADHD, particularly those with the combined type, have great difficulty obeying reasonable rules and regulations. When asked to do something by an authority figure, they may refuse or even become abusive. Punishment often does not help. Children with ADHD with defiant behaviour are very hard to discipline. As they get older, they may get into problems with stealing, fire lighting, and other antisocial behaviour.

Defiant behaviour is described further in Chapter 6.

### Sleep problems

Many children with ADHD have difficulty falling asleep and are up until late at night. They often complain that their minds are too active. Once asleep they may be restless—their beds are often a rumpled, dishevelled mess the next morning. Others may so exhaust themselves with their overactivity during the day that they fall asleep and sleep soundly. Many children with ADHD persist with bedwetting later than other children. Night terrors, sleepwalking, and bedwetting are all more common in children with ADHD.

## Associated (comorbid) conditions

There are a number of conditions that are more common in individuals with ADHD than in the general population. The tendency of a condition to coexist with another is known as *comorbidity*. This comes from the medical term *morbidity*, which relates to the proportion of people having a particular disorder (not to be confused with the term *mortality*, which refers to the proportion of people dying from a condition).

The comorbid conditions associated with ADHD are listed in Box 1.1.

**Box 1.1 Comorbidity: conditions that are more common in individuals with ADHD**

Tic disorder
Dyslexia
Oppositional defiant disorder
Conduct disorder
Autism spectrum disorder
Depression
Anxiety disorder
Obsessive–compulsive disorder
Disruptive mood dysregulation disorder
Bipolar disorder

A child with ADHD may have more than one comorbid condition. For example, a child with ADHD can have anxiety and conduct disorder in addition to ADHD. While comorbid conditions are more common in individuals with ADHD, most individuals with ADHD will not develop a comorbid condition.

Parents who have a child with ADHD, who has a particular comorbid condition, can find out more about the disorder by referring to the relevant section of this book. Tic disorder is discussed in Chapter 4. Dyslexia is described in Chapter 5. Oppositional defiant disorder and conduct disorder are described in Chapter 6. A description of autism spectrum disorder can be found at the end of Chapter 8. Depression, anxiety disorder, obsessive–compulsive disorder, disruptive mood dysregulation disorder, and bipolar disorder are all dealt with in Chapter 9. The reason why comorbid disorders occur more commonly in individuals with ADHD is explained in Chapter 10.

## How common is ADHD?

ADHD is one of the most common conditions in childhood, affecting as many as 5% of school-aged children and 3% of adults. It affects about three times as many boys as girls and occurs in all ethnic groups.

It seems that the predominance of boys in the overall number is due to their overrepresentation in the combined group. In the inattentive group, there are as many affected girls as boys.

The combined type is three times more common in boys in the community, yet many clinics see six times as many boys with this type. It seems that boys with the combined type are far more likely to be noticed than girls with this type. Despite the predominance of boys, the combined type can be just as severe in an affected girl as in a boy.

For all types of ADHD, mildly affected individuals greatly outnumber severely affected individuals.

## When does ADHD start?

Although the difficulties in both types of ADHD are present from birth, problems generally do not become apparent until later in childhood.

In children with the combined type, the behavioural problems are often apparent from infancy. Such children are generally difficult babies and active, challenging toddlers. The child's teacher may complain that she is not managing in the classroom and playground from the earliest school years.

In children with a milder form of this type of ADHD, the child may manage in primary school without much difficulty but, with the onset of puberty and the greater demands of high school, problems often emerge.

Children with the inattentive type of ADHD generally experience difficulties with schoolwork when the work becomes more demanding. While some do develop reading and writing delays in primary school, many manage well until late primary or early high school. High school requires skills in self-organization, sustained concentration, proficient written expression, and self-direction that these children often do not possess.

## Historical background

ADHD is not a new condition. The first description of children with the disorder was by an English physician, Dr. George Still, in 1902. He described 20 children in his practice with impaired concentration and overactivity. He recognized that this was not due to any fault in their upbringing. Dr. Still did not give the condition a name.

Interest in the condition was rekindled after an encephalitis epidemic in the USA in 1917–18. Many children acquired a form of encephalitis that left them with attention difficulties, overactivity, and impulsivity. In such children, the encephalitis virus had damaged parts of the brain that are impaired in children with ADHD, and hence their problems were similar.

Since that time, ADHD has become the most studied developmental disorder in childhood. Several name changes attest to the rapid evolution in our understanding of this condition. In the 1950s, attention was focused on children with hyperactivity and the term *hyperkinetic–impulse disorder* was used. In the 1960s the term *minimal brain dysfunction* was widely used for children with ADHD.

In the 1960s, attitudes to ADHD in the UK and the USA began to diverge. In the UK and other parts of Europe, the International Classification of Diseases (ICD) of the World Health Organization was followed. At that time, this classification recognized only children with 'hyperkinetic disorder', a term applied to children with severe overactivity.

In North America, a different classification of disorders, the Diagnostic and Statistical Manual (DSM) of the American Psychiatric Association, was followed. In the USA, largely due to the work of the Canadian psychologist Virginia Douglas, impairment in concentration (i.e. attention), rather than overactivity, was perceived as the fundamental deficit in this disorder. The term *attention deficit disorder* (ADD) was then introduced in the USA for the condition. Both children with and without hyperactivity were recognized as having ADD. Those with hyperactivity were considered to have ADD +H while those without were considered to have ADD –H.

In the late 1980s, the term ADHD was introduced in the USA to describe those with the hyperactivity and/or impulsivity, while the term ADD was reserved for those with poor concentration alone.

Since 1994 in the USA, the term *attention-deficit/hyperactivity disorder* (abbreviated to 'ADHD') has been used to encompass the spectrum of children with all forms of the condition. The three subtypes *inattentive*, *combined*, and *hyperactive–impulsive* were introduced at this time. It is this terminology, with the abbreviation ADHD, that is followed in this book.

Over the past two decades, attitudes to diagnosis and treatment in the UK and the rest of Europe have increasingly followed those in the USA. The 1990 update of the ICD (ICD-10) and the 1994 update of

the DSM (DSM-IV) were very similar in their criteria for diagnosis of the condition. This continued in the DSM-5 (published in 2013).

Further landmarks in this convergence of views included the recommendations published by the National Institute of Clinical Excellence (NICE) in the UK in November 2000 and the International Consensus Statement on ADHD published in January 2002. The role of NICE is to provide patients, health professionals, and the public with 'authoritative, robust, and reliable guidance' on current best practice in health issues. Their approach was consistent with US practice. The International Consensus Statement was issued by over 90 of the world's leading scientists, researchers, and clinicians treating ADHD from 12 countries, including the USA and the UK. It reflected the unanimity of views across the Atlantic.

All English-speaking countries now use the same terminology, criteria for diagnosis, and treatment protocols. No matter where they live, children with ADHD and their families benefit from the huge amount of research undertaken in centres all over the world, as well as from the wide range of literature, videos, and equipment directed at helping parents and teachers assist children with ADHD.

With the realization that a proportion of children with ADHD continue to have difficulties throughout adulthood, an increasing amount of research and support is now also being directed to ADHD in adults.

**Myths about ADHD**

**ADHD is not a real medical condition**

ADHD is recognized as a medical condition by the vast majority of health professionals, health organizations, and all disease classification systems internationally.

**ADHD only affects boys**

Boys and girls are affected almost equally, but the condition is often missed in girls.

**A child who is not overactive or badly behaved, or who can concentrate on computer games, cannot have ADHD**

Many children with ADHD are not overactive and are well-behaved. They can also often concentrate on computer games and certain other activities because these involve an area of the brain that is not affected by the condition (see Chapter 10).

**ADHD is the result of bad parenting**

ADHD is caused by a deficiency of certain chemical messengers in the brain. It is predominantly genetic rather than environmental in origin.

**Children always grow out of ADHD**

In a proportion of children, the condition persists through adulthood.

**Children with ADHD who are treated with medicine are more likely to abuse drugs when they are older**

This is the opposite of the truth. Children with ADHD who are treated with medication are significantly less likely to abuse drugs later than those who are not.

---

[1] In the past, the combined type was known as 'ADHD' and the inattentive type as 'ADD', but since 1994 this terminology is no longer used. See 'Historical background' later in this chapter.

SECTION 2

# Some characteristic difficulties

# 2

# Poor concentration

## Key points

- It is wrong to believe that children with ADHD cannot concentrate at all. Their mechanisms for concentrating are inefficient and unreliable, not absent.
- Difficulties with concentration result in children with ADHD often being confused and unable to understand instructions.

**A mother's description**

'Peter must pay attention.' 'Peter is too easily distracted in class.' 'Peter must take care not to be so careless.' These are the comments that keep recurring in our son's report cards from year to year. It has always been difficult to get Peter to concentrate on schoolwork. His mind always seems to be elsewhere. When he does attend, he is soon distracted. Getting him to do his homework is a constant battle. Last year I was finding it so stressful that I decided not to get involved with his homework at all. As a result, Peter spent many afternoons on detention. Unfortunately, this did not seem to help.

Peter's distracted state means that he often does not hear what the teacher is saying. He frequently loses notes that he should bring home. He has trouble carrying out instructions at home too. If I ask him to do something, he becomes distracted midway through, or forgets what I asked him to do.

He is terribly disorganized. I have to organize and supervise him in everything. If I did not keep tabs on everything he needs to do for school, he would never succeed. In the last three weeks he has lost his glasses, his school diary, and his lunch box.

The perplexing thing is that Peter can concentrate very well when something interests him. He can spend hours totally fixated on a

video game. When I pointed this out to my family doctor, he thought that it meant that Peter did not have ADHD. But the assessment by the paediatrician and psychologist showed that Peter does have ADHD.

## Poor concentration in children with ADHD

Children with ADHD often have difficulty giving close attention to details. As a result, they make careless mistakes in their schoolwork. They often do not follow through on instructions and fail to finish schoolwork, chores, and other duties. Children with ADHD are very easily distracted, particularly in a group setting. They tend to be forgetful in daily activities. Their difficulties seem to be greater for concentration on things they must listen to (auditory attention) than for things they must look at (visual attention). It can be confusing to parents and teachers that such children can concentrate well on certain things, and not others.

To understand the difficulties that children with ADHD face we must first understand the attentional process in the brain and how it is controlled.

## The attentional process in the brain

When our eyes are open, a great deal of information about everything in our field of vision travels from our eyes to the brain. This picture of our whole visual field in the brain is known as the *visual buffer.* When we concentrate, our brain selects a portion of this information on which to focus. The portion selected for attention is called the *visual attentional window*. This attentional window can shift from one part of the visual buffer to another. Not only can it change its location, but it can also expand or shrink its scope, like a zoom lens.

There is a comparable attentional mechanism for listening. The *auditory buffer* contains all the audible sounds at a particular time. The *auditory attention window* focuses on one particular source of sound, in the way a radio tunes into one particular station.

With well-controlled attentional mechanism in the brain, the visual and auditory attentional windows can be focused on one part of their respective buffers for long periods of time. This leads us to the

question of how the visual and auditory attentional windows are controlled.

## The two kinds of attentional control

There are two types of attentional control. The first comes from the environment and is referred to as ‘externally controlled’ (or *stimulus response*) attention. The second comes from the brain itself, and this is ‘internally controlled’ (or *executive*) attention.

### Externally controlled attention

All animals have this primitive form of attentional control. It is the default mechanism in humans, meaning that it is automatically present unless overridden by the internal control mechanism. Externally controlled attention requires little effort on the part of the brain. The work is expended by the environment, and all the attentional window must do is follow what is most interesting (salient) in the visual or auditory buffer. Being a primitive system, the mechanism takes place in primitive parts of the brain, which for humans lie at the base and back of the brain.

An example of this type of attention occurs when a lion keeps a deer it is stalking in its attentional window. The deer represents food to the lion and wherever the deer moves, the attentional window will follow, driven by a reward centre deep in the brain. The deer leads and wherever it goes, the lion will follow. In a human, an example of this kind of attentional control would occur when a child plays a computer game. The game is designed to reward the child for a correct response and to lead the child from one step in the game sequence to the next, with constant feedbacks and rewards. All the child must do is to respond to changes in its external environment (the screen). In fact, it would be more accurate to say that ‘the game is playing the child’, in the same way that the deer is leading the lion. In both cases, the environment does the work and the brain simply responds. This is relatively effortless and, because constant rewards are provided, there is ongoing gratification that keeps the process going.

Not surprisingly, humans usually find this type of attention effortless and automatic (e.g. when we drive our car along a familiar route and don’t even realize we have been concentrating and making decisions along the way). Because this type of attentional control requires little effort, it is often perceived as pleasurable. This form of concentration

is referred to as *autotelic* and people involved in this type of concentration may describe it as 'being in the zone'.

### Internally controlled attention

From an evolutionary point of view, more recent parts of the brain have developed to provide a second type of attentional control that can override the automatic, externally controlled attention at times. In this kind of internally controlled attention, the environment does not lead the brain; instead, the brain must do the work with little or no feedback from the environment, and no immediate reward. This attention is controlled internally by mechanisms in the frontal lobe of the brain—the part of the brain that evolved relatively recently. Attention controlled in this way is known as *executive attention* because the brain acts as an executive in charge of an organization. Here immediate gratification does not play a part. Instead, attention is maintained based on a future (often intangible) reward.

The efficiency with which executive attention can override immediate gratification increases as children grow older. This is because the front part of the brain, which is required for such attention, becomes more competent with age. A younger child's attention will wander unless the material in the attentional window is very interesting, and what is present in the rest of the buffer is relatively boring. Even then, the attentional mechanism quickly tires, and attention cannot be sustained for long.

Selecting part of the buffer and sustaining attention on one part of the buffer is generally more difficult for auditory than for visual stimuli, so listening is generally harder than looking. This is especially so for children with ADHD.

## Attentional control in children with ADHD

Externally controlled attention is perfectly normal in children with ADHD. However, their internally controlled attentional mechanism is inefficient.

Although children with ADHD have inefficient internally controlled attentional mechanisms that quickly tire, it is wrong to believe that these mechanisms do not work at all. Their internally controlled attentional mechanisms are *inefficient* and *unreliable*, not absent. It is this that makes their performance so inconsistent.

Having an immature concentrating mechanism is like having a weak leg that allows one to walk for short bursts but does not allow one to keep up with one's peers for long stretches. Children with ADHD are easily fatigued when their attention needs to be controlled by internal mechanisms.

Attentional mechanisms are more stressed under certain circumstances than others, and it is in the difficult situations that children with ADHD are most likely to find that their attentional mechanisms are failing.

Tedious tasks are very difficult for immature executive attentional mechanisms. Therefore, younger children cannot be expected to concentrate for long periods on tedious tasks. Much of the work that schoolchildren need to perform is unavoidably tedious, and children with ADHD quickly become distracted. A normal child does not find the work any more interesting than the child with ADHD. Rather, it is just that the normal child finds concentrating easier.

The attentional difficulties may give children with ADHD an unfocused appearance. Common descriptions include 'vague', 'dreamy', and having 'glazed eyes'.

Children with ADHD tire easily when having to concentrate, with the result that their work may be full of good beginnings that frequently peter out. Often their schoolwork will be much better in the morning when they are fresher and better able to compensate for their attentional difficulties. This may be true for all children, but for those with ADHD, the contrast will be greater.

If the task is long or arduous, children with ADHD quickly lose concentration. Therefore, they are often described as being impersistent.

This is further compounded by their difficulty in working for a distant reward—their lack of incentival motivation.

Difficulties with concentration also result in children with ADHD often being confused and unable to understand instructions. When the child with ADHD must listen, he has difficulty remaining tuned to the 'right station'. His concentration is easily distracted onto other sounds with the result that he hears only parts of the instruction. No wonder parents say that their instructions 'go in one ear and out the other'.

These difficulties may be compounded by the problems with short-term memory and language comprehension that frequently occur in children with ADHD.

A common observation made about the visual attention of children with ADHD is that they may seem to 'see everything at a glance'. Because of their difficulty with sustained attention, they may become reliant on a quick appraisal of any new situation. They may, therefore, surprise parents and teachers by how much they can take in with seemingly little effort. However, they have difficulty absorbing more than the superficial features, and they lack attention to detail.

Children with ADHD tend to flit from one thing to another. Parents often notice how poor such children are at occupying themselves. Having moved quickly from one toy or activity to another, they quickly lose concentration and can then become aimless. It is at times like these that their behaviour may be motivated by wanting to attract attention, or they may get into mischief.

Another difficulty for children with ADHD is in adjusting their level of attention to suit the situation. For example, at recess or breaktime, children are less focused in the playground, and when they return to the classroom afterwards, they are required to focus their attention. Children with ADHD have great difficulty coping with such transitions. Instead of increasing their state of alertness once in the classroom as other children of the same age do, children with ADHD remain unfocused and do not settle back to work again. The difficulty is in harnessing internally controlled attention after a period in which it has not been in use.

Children with ADHD have their greatest difficulty sustaining concentration if there are many distractions. The usual classroom is full of distractions because of the presence of so many other children, and children with ADHD are at their worst in such an environment. By contrast, they are at their most attentive and learn best in a one-on-one setting.

Sometimes, a small group of children with ADHD is withdrawn from the large classroom for special help in the hope that they will do better with fewer distractions. However, this environment is likely to be even more distracting because children with ADHD usually distract one another. Whenever possible, children with ADHD should not be grouped together in a class and special help should be given in a one-on-one setting.

Children with ADHD will concentrate best if they are receiving frequent positive feedback. They usually manage best if the work is very interesting and if there are immediate rewards or consequences for their actions.

For children with ADHD, concentration is usually at its best early in the day and diminishes as their attentional mechanisms fatigue. Parents and teachers are advised to arrange for demanding work to be covered in the first part of the day, and to make some allowance for reduced concentration as the day progresses.

Children with ADHD are often ‘addicted’ to externally controlled attentional activities (such as video games). They are less able to derive the vicarious and intangible pleasure that internally controlled attentional activities afford and so, to compensate, they seek pleasure through externally controlled attentional activities.

# 3

# Impulsivity

Key points

- The impulsivity of children with ADHD manifests itself in several ways. They may act impulsively, think impulsively, and/or feel things impulsively.
- Children with ADHD who behave in an impulsive way do not do so because of ignorance. They know what to do; they cannot always do what they know.

Impulsivity, the difficulty in being able to think before acting, causes many problems for children with ADHD, both at home and at school. Teaching the child to consider the consequences of an action often does not solve the problem of impulsivity in a child with ADHD. Children with this condition lack the reflective and behavioural inhibition mechanisms needed to apply such teaching to their everyday lives.

## Behavioural inhibition mechanisms in the brain

Normal preschool children are impulsive creatures. If they see something they want, they usually cannot resist the temptation to take it. If they do not like something, they act out their aggression or frustration without any thought of the consequences. In children of this age, we regard this as normal behaviour.

In 1970 Jeffrey A. Gray first proposed the theory that certain structures in the frontal part of the brain act as a behavioural inhibition system (BIS) to control behaviour. Although Gray's theory was based on work with rat brains, identical structures exist in the human brain. The reason very young children are so impulsive is that their brain BIS is not yet active. Their behaviour is a simple reflex arc —like a knee-jerk reaction.

As the frontal lobe of the brain develops, the nerve cells (*neurones*) that control behaviour become more powerful and start playing a mediating role between the input and output of the brain. This allows the individual to stop and think before acting. Only then can the knowledge and experience that the child has acquired play a role in preventing impulsive responses.

Children with ADHD who behave in an impulsive way do not do so because of ignorance. Like other children of their age, they usually know what they should and should not do. However, they respond in a reflexive (impulsive) way to the things that happen around them. If one observes the behaviour of children with ADHD with this in mind, their repeated misdemeanours and failure to 'learn' from their mistakes—and from punishment—is understandable.

Telling a child with ADHD to 'stop and think' is often asking the impossible. It would be analogous to asking an adult not to put out a hand to break a fall. The knowledge that one is going to fall on something soft does not prevent the reflex action of stretching out one's hands. Similarly, knowledge is not enough to stop the child with ADHD from behaving impulsively. It is only when the BIS starts to become active, either because of normal brain maturation or by being 'switched on' by medication (discussed in Chapter 15), that the child with ADHD is able to stop and think before acting.

## Manifestations of impulsivity

The impulsivity of children with ADHD manifests itself in many ways. They act impulsively, think impulsively, and feel things impulsively.

Most obvious is the tendency to act without thinking. This may mean that the child endangers himself or others by risk-taking acts. It also means that the child is likely to make heedless or careless errors because of his failure to think carefully.

Children with ADHD will sometimes act on a whim or with minimal encouragement, especially from another child; other children may take advantage of this. Children with ADHD are often 'set up' by other children to do things that the other children recognize as dangerous. Their difficulties are further compounded because they generally lack the guile not to get caught. Often a child with ADHD will join in with several other children in carrying out some misdemeanour, and it is only the child with ADHD who is caught. A further disadvantage is that the child with ADHD, having gained a

reputation for foolhardy behaviour, is often blamed for a misdemeanour whether guilty or not.

Because they take risks, children with the impulsive type of ADHD are accident-prone. It is not uncommon for children with this form of ADHD to have broken a number of bones during childhood. Accidental poisoning and burning are also more common in this group of children.

Children with ADHD are often compulsively destructive. They are quick to damage or destroy toys. Parents are often puzzled because their child may destroy toys that she enjoys. Furthermore, the child does not seem to be able to control this behaviour. Their impulsivity also means that they are generally harder on their toys and are more likely to damage their parents' property and the property of others.

It is extremely difficult for an impulsive child to wait in line when queuing is needed. He is also likely to blurt out in class and to find it difficult to wait his turn in a game or other activity. Children with ADHD often provide answers that show that they have not listened carefully to the question.

Children who are impulsive quickly learn to take short-cuts in the way in which they do things. They want to finish things quickly and will find all kinds of ways of getting to the end of an activity without worrying about the quality of what they produce.

Impulsivity gets in the way of delaying gratification, and children with this difficulty find it almost impossible to work for a long-term goal. They are reward-driven like other children but need that reward immediately. Parents will find that, if a treat is promised, children with ADHD will nag incessantly while waiting for it. Parents often learn not to tell their child about treats and outings because they want to avoid the constant nagging that goes on until the reward or treat is given, and because these children over-react should the outing or treat not occur.

Children with ADHD often cannot stop themselves from touching things or people. Other children of the same age may respond badly to this touching. Parents often complain that children with ADHD cannot keep their hands to themselves. The habit of touching things can be embarrassing to the parents when they take their child out, and things may get broken when the child is visiting or shopping.

Impulsive thinking makes children with ADHD illogical at times. Instead of thinking about things in a clear sequence, they move

impulsively from one idea to another. It is difficult to reason with a child who thinks in this way.

Situations or games requiring sharing, cooperation, and restraint with peers are particularly problematic. Group situations are particularly difficult for children with ADHD, because it is in such situations that the individual's impulsivity must be subjugated to the needs of the whole group.

A tendency towards impulsivity interferes with a child's ability to carry out sequential tasks; that is, the ability to get things into the right order. Children with significant difficulty in sequential organization will experience problems with tasks like following directions, counting, telling time, using a calendar, and getting to know the day's schedule. Such a child will often have difficulty getting dressed quickly, having the correct books ready for a class, getting to the right classroom, and following complex instructions. It may also result in spelling errors, such as 'hegde' for 'hedge' and 'fisrt' for 'first'.

Therefore, children with ADHD often benefit from having a set routine; they are at their best in a structured situation where their impulsivity is contained. A regular course of events helps a child anticipate the next activity and remember the schedule.

Emotional impulsivity results in quick changes of mood. Children show this by having 'a short fuse' and a low frustration tolerance. Parents will notice that the child seems to be managing quite well and then suddenly becomes upset for no apparent reason. The cause may be a spontaneous thought or emotion that the child's brain cannot inhibit. Children with impulsive ADHD may have difficulty controlling their tendency to be noisy. Generally, they are boisterous children who are more talkative than their peers.

## Management of impulsivity

Cognitive therapy, a form of therapy that aims to teach children self-control, has generally shown disappointing results in children with ADHD. However, it is worth trying this form of therapy in a motivated and insightful child as he may be able to develop a greater ability to stop and think before acting.

In contrast to the generally disappointing results with cognitive therapy, medication usually plays a dramatic role in controlling impulsivity. In many children, medicine alone is enough to ameliorate this difficulty. In others, concomitant use of medication improves the efficacy of cognitive therapy.

Parents, teachers, and others who encounter the child with ADHD need to understand that impulsive behaviour is not completely under the child's control. Wherever possible, allowances should be made for this. Environmental changes and modification of goals are important ways of helping the child. For example, parents should ensure that children with ADHD who take risks because of their impulsivity are properly supervised in potentially dangerous situations. Matches, sharp knives, poisonous chemicals, and other potentially dangerous implements and substances need to be kept out of the child's reach.

Finally, short-term, easily obtainable goals may need to be set. For example, it may be unrealistic to punish an impulsive child with ADHD every time she calls out an answer in class. It may be more appropriate to set her the goal of not more than one such outburst per lesson. The child should be praised if she successfully limits her behaviour in this way.

# 4

# Excessive movement

Key points

- Many children with ADHD are not overactive.
- Those children with ADHD who do have overactivity become less active, and sometimes even underactive, as they grow older.

This chapter describes two quite different types of excessive movement that may occur in a child with ADHD.

The first is the hyperactivity (overactivity) that occurs as a symptom of ADHD in some, but by no means all, children with the disorder. The second type of excessive movement occurs if the child also has a tic disorder in addition to ADHD. A tic disorder is a condition that manifests as repetitive movements and/or vocalizations. Tic disorders occur more commonly in children with ADHD.

## Hyperactivity

### Temporary immobilization—a developmental skill

If one visits a preschool and observes a group of three-year-olds, and then visits a primary school and observes a group of eight-year-olds, one notices an important difference: the younger children are more restless and fidgety than the older children.

Filming of children of different ages shows that the level of activity in normal children decreases markedly in the first three years of life and then, more gradually, over the rest of the school years.

This is most likely to be due to the greater influence, with increasing age, of inhibiting mechanisms in the brain that temporarily immobilize parts of the body when they are not needed. Young children cannot efficiently immobilize muscles in this way, and associated movements

of their bodies, such as *mirror* movements and overflow movements, are common. Mirror movements occur when a child does something with one side of the body, and another side moves in unison. Younger children also have more 'overflow' movements. These are a tendency for some part of the body to move when the child is excited or concentrating (e.g. moving the tongue while writing).

The persistence of immaturities of motor function, such as mirror and overflow movements, constitute part of the 'soft' neurological signs that are common in children with ADHD of all ages and provide evidence of immaturity of parts of the brain that control movement in these children.

Many children with ADHD have a degree of muscular overactivity that indicates that movement-inhibiting mechanisms in the brain do not seem to be as mature as they should be.

With great effort, a child with ADHD can temporarily inhibit her excessive movement. However, without appropriately mature movement-inhibiting mechanisms she cannot sustain this for long. Asking a child with ADHD and hyperactivity to sit still is asking the impossible.

## Varying degrees of overactivity

No aspect of ADHD has caused more confusion than that of overactivity. As discussed in Chapter 1, ADHD used to be called *hyperactivity*. This meant that unless overactivity was present, the diagnosis was not made. However, we now know that overactivity may be so mild as to go unnoticed in children with the disorder.

The degree of overactivity of children with ADHD varies from the child with nothing more than excessive feelings of restlessness, to the child who is almost never still.

There are no instruments that reliably measure activity levels, but three descriptive categories of overactivity are usually recognized.

### Restless feeling

Many children with ADHD are not unusually active for their age. These children simply complain of feelings of restlessness.

### 'Fidgets'

A child with the 'fidgets' may be described as 'a can of worms', 'a rocker', 'a jiggler', 'a wriggler', or 'a squirmer'. These children may squirm their bodies when they are seated. They may fidget with their

hands, for example, by drumming on the table or fiddling with things on their desk.

#### Runners and climbers

Children with ADHD who have the more severe form of overactivity are often described as 'being driven by a motor'. Such children are almost never still. They run instead of walking. They do not like to be restricted in any way. If held, they usually try to wriggle free. They will clamber over objects and climb onto things when other children of their age no longer do such things.

Such behaviour often leads to repeated falls and injuries, such as bruises, cuts, and grazes. This is particularly the case in children with ADHD as they often have a poor sense of danger, are impulsive, and learn poorly from experience.

When children with this sort of overactivity level become tired, their activity level may increase rather than decrease, making it difficult for them to fall asleep.

### Underactivity in older children with ADHD

Most overactive children with ADHD become less active as they get older. Some remain 'outdoor' children who much prefer being active to sitting still. Some may develop normal levels of activity as adolescents.

Other children with ADHD may become less active than their non-ADHD peers in adolescence. These children become reluctant to take part in physical activities. They prefer to spend time in front of the television or a video game. Such 'couch potatoes' run the risk of becoming obese from eating inappropriately for their activity level.

## Tic disorders

A tic is a sudden, repetitive movement or vocalization (production of a sound). The movement may occur in any part of the body. The sound may range from a meaningless grunt to a short phrase.

### Types of tic

#### Motor tics

A motor tic consists of a repeated movement. *Simple motor tics* consist of brief, sudden movements and include eye blinking, neck

jerking, shoulder shrugging, facial grimacing, and mouth opening. *Complex motor tics* are distinct, coordinated patterns of successive movements involving several muscle groups and include grooming behaviours (such as arranging the hair), clapping, and smelling an object.

**Vocal tics**

A vocal tic consists of a repeated sound or vocalization. *Simple vocal tics* include throat clearing, grunting, sniffing, barking, and snorting. *Complex vocal tics* include repetition of single words or phrases (out of context). If the word or phrase is rude this is known as *coprolalia*. If the child repeats his own words this is known as *palilalia*. If he repeats the last word he has heard another person speak, this is known as *echolalia*. Coprolalia, palilalia, and echolalia are all extremely rare.

## The cause of tics

Tics come about because of a genetically determined oversensitivity (*hyper-reactivity*) of certain brain cells that control muscular movement and sound production. In children who inherit a predisposition to tics, these cells become oversensitive to certain normal brain chemicals (neurotransmitters) that transmit impulses from one nerve cell to the next. It is this oversensitivity that gives muscles a tendency to be 'twitchy' and the speech centre a tendency to 'misfire'.

## Will the tics go away?

Tics may begin at any age after infancy. Once they appear, they come and go, often for no discernible reason.

The nature of the tic may change over time. More than one tic may be present at one time.

In a small number of children, the tics may become significantly worse for a period. During such a 'tic crisis', tics become more widespread and the movements and vocalizations more marked. A tic crisis usually resolves spontaneously after days or weeks.

Most individuals grow out of their tics at puberty.

## The link between ADHD and tics

Tics are more common in individuals with ADHD: they occur in approximately 25% of those with the condition. Nearly all children

with *severe* tics will have ADHD. This association (comorbidity) occurs because tics and ADHD share several causative genes. This is described further in Chapter 10.

## Tic triggers

Tics may be triggered or exacerbated by emotional stresses, such as anxiety or fatigue. Stress may aggravate tics, often in a cyclical way: stress increases tics, but tics also increase stress because they embarrass the child.

Tics are sometimes referred to as *nervous habits*, but while a tic may become more prominent when the child becomes self-conscious or emotionally stressed, it is not actually caused by anxiety—only made worse by it.

Tics are occasionally triggered by some physical condition that causes discomfort to the affected part of the body. For example, a child may acquire an eye infection and then start blinking. The blinking continues after the original trigger has resolved. Sometimes parents will seek many opinions and try numerous treatments under the misconception that the tic is caused by a physical disorder in the affected part of the body (e.g. that a coughing tic is due to asthma). Such treatments will prove fruitless if the movement is a tic.

## ADHD medication and tics

The two main medicines used in ADHD, methylphenidate (Ritalin) and dexamphetamine, can trigger a tic in susceptible children. They can also worsen a tic that has already appeared.

It must be emphasized that in most children with ADHD these medicines have no effect on tics, and in some children, tics improve when one of these medicines is taken.

Research reported in 1999 indicated that when children with ADHD who received one of these medicines were compared over the span of several years to children who had not, the proportion in whom tics ultimately appeared was not statistically different. Similarly, the proportion in whom tics ultimately resolved was also no different. This has led most doctors to accept that, while these medicines may cause a tic to appear earlier than it otherwise would have, such a tic would eventually have appeared even if the child had not taken the medicine. Furthermore, these medicines do not seem to affect the chance of the tics eventually resolving.

In the light of these findings, children with ADHD who have tics can be given these medicines, if required. If tics worsen, the medicine should be stopped to check whether the tics then improve. If they do, it is necessary to restart the medicine for a short time to observe whether the tics reappear. This last step is important because tics so often improve for no discernible reason. Thus, the improvement may have been incidental and not connected with stopping the medicine.

If reintroducing the medicine after it has been stopped worsens the tics, it is best to try an alternative medicine. If a suitable alternative medicine cannot be found, a decision must be made as to whether the improvement in the child's ADHD symptoms justifies worsening of the tics. In some children, the positive effect of the medication on the child's mood and learning justifies continuing with the medicine; in others, it does not.

## Tourette disorder

The term 'Tourette disorder' (also known as Tourette syndrome) is appropriate if there are multiple motor tics *and* one or more vocal tics that have been present for over 12 months. The name was bestowed by the French neurologist, Jean-Martin Charcot, in honour of his intern, George Gilles de la Tourette, when Charcot first reported the condition in 1825.

Tourette disorder has often been inaccurately portrayed on the television and in movies. This has led to a misconception that individuals with the disorder often display unusual features such as coprolalia (a vocal tic involving socially unacceptable, often obscene, words) and echokinesis (a complex motor tic involving imitation of someone else's movements). There has also been a tendency to portray individuals with the disorder as if an unusual temperament and limited abilities were part of the condition. In fact, coprolalia and echokinesis are extremely rare in Tourette disorder, and most individuals with the disorder have a normal temperament and are of average ability. The majority of individuals with Tourette disorder have a mild form of the condition.

A proper use of the term Tourette disorder is based on the *past* pattern and duration of the tics. The diagnosis of Tourette disorder does not imply that the tics will persist throughout the individual's lifespan. Many children with the condition will grow out of their tics at puberty.

## Treatment of tics

### Stress reduction

Since tics are often made worse by self-consciousness and stress, it is usually best to try to ignore a child's tics. Adverse comments and reminders to stop the tics will usually make them worse.

A child with tics may be able voluntarily to suppress her tics in certain situations, but such self-control should not be taken for granted, as it is usually impossible for a child to sustain this.

Some children with tics benefit from learning stress-reduction techniques from a psychologist. Cognitive therapy (mind over matter) training is helpful for some children. A child may also be taught techniques to cover up her tics and to deal with the questions and comments of others. The psychologist will also help the parents and child to better understand the types of tics the child is having, in what situations the tics are at their worst, and, if possible, how to avoid these situations.

Teachers will need to have the tics explained to them, as both motor and vocal tics may be misinterpreted as rude or disruptive behaviour within the classroom. The result is that the child may be punished for something she cannot control.

### Habit-reversal training

Habit-reversal training is an effective technique for some individuals with tics. It consists of two parts: *awareness training* and *competing response training*.

In awareness training, the individual is taught to identify each tic out loud. In competing response training, the individual learns to perform a new behaviour that makes the tic movement impossible. For example, if the tic consists of rubbing the hands together, the new behaviour could be placing a hand on each knee so that the hands can no longer be rubbed together.

### Medication

There are several medicines that can reduce tics by affecting brain chemicals (neurotransmitters). These can be very effective in some children and may eradicate tics completely. There is no one medication that is best for everyone with tics. The most common medicines used for this purpose are clonidine and the 'atypical neuroleptic' medications, for example, risperidone.

### Preventing accidents

A sudden motor tic while carrying out certain activities may put a child and those around her at risk. Activities, such as carrying hot fluids or learning to drive, will therefore have to be curtailed for some individuals with severe tics. If tics persist into late high school, the choice of vocational training will also need to consider the effect of the individual's tics in the workplace. For example, training to be a cook would be inappropriate if a sudden movement while handling hot fluids could put the individual and her workmates at risk. Similarly, a career as a hairdresser would be unsuitable if an uncontrolled movement of the hand could place a client in danger.

# 5

# Learning difficulties

## Key points

- Specific deficits in information processing in the brain are the commonest causes of academic difficulties in children with ADHD.
- For many children with ADHD, academic difficulty is not confined to a particular subject but occurs across a number of areas of study.

A child with ADHD may underachieve at school for a variety of reasons. Learning difficulties may occur in children both with and without behaviour problems. Even when behaviour problems are present, the learning difficulty may be related more to impairment in information processing than to the behaviour problem.

Specific deficits in information processing in the brain are the most common causes of academic difficulties in children with ADHD. This chapter describes these deficits as well as the behavioural and emotional difficulties that may contribute towards poor school performance in children with the disorder. The chapter concludes with discussion about the association of ADHD with dyslexia, and the special problems of gifted children with ADHD.

This chapter does not cover management of learning difficulties in children with ADHD; this topic is covered in Section 5.

## Areas of difficulty

ADHD can affect any area of school performance, but language-based subjects are most commonly involved. Essay (story) writing is typically poor in children with ADHD. These children may have good ideas that they can express orally (oral expression), yet they find it extremely difficult to put their thoughts down on paper (written

expression) in a coherent way. Their attempts usually consist of meagre amounts of poorly expressed written work. Spelling and reading comprehension are also often poor.

Some children with ADHD also have difficulties with oral expression and cannot give a coherent, sequential account of their experiences or ideas when speaking. They find it difficult to find the appropriate word when speaking, called *word-retrieval deficit*, and may say an incorrect word as a result.

In a child with language-based learning difficulty, poor reading may impair the child's understanding of mathematical word problems. Nevertheless, for some children with ADHD, weakness in mathematics is unrelated to impairment in language-based learning. Such children experience mathematical difficulties that relate to deficits, such as poor working memory and impulsivity.

For many children with ADHD, academic difficulty is not confined to a particular subject but occurs across several areas of study. In such children, weak organizational skills, lack of motivation, poor behaviour in class, and/or an inability to get on with teachers or peers may be the cause of their poor grades. In some children with ADHD, the major problem is poor performance under examination conditions.

## When the problems become apparent

Children with severe processing or behavioural problems may encounter difficulties from their earliest school years. However, many children with the condition manage the less-demanding primary school years and only experience problems in high school or secondary school. Here, it is common for children with mild ADHD, particularly the inattentive type, to first encounter difficulties.

Children with ADHD associated with behavioural problems may also experience greater difficulties in high school because at this time their behaviour worsens due to the hormonal changes of puberty. The combination of ADHD, puberty, and the increasing demands of high school often cause problems to worsen, or to surface for the first time, in high school.

## The causes of learning difficulty in ADHD

### Poor concentration

Some children with ADHD absorb and retain little information in the classroom because they are so easily distracted. They gaze out of the window, they stare into space, and their thoughts are far removed from the content of the lesson. Such a child may misunderstand the teacher's instructions and feel quite lost in the classroom. He may have to phone another child every afternoon to find out what homework has been set. He may be unaware of assignments that the teacher has set and deadlines that he must meet. His homework diary may be empty or filled with doodling and other scribbling unconnected with the lessons. In the class he may disturb others by talking. He will be slow to start work and, because he is so easily side-tracked, he will often fail to complete work in the allocated time. He may regularly have to stay in during breaks to complete work.

A child of this type will also find it very difficult to revise his work at home. He may remain in his room for long periods, ostensibly 'studying', but with little actually achieved. He may find it impossible to stay in his room to study and keep coming out, often with excuses that he needs a snack, to go for a walk, or some other diversion.

Such a child often finds it impossible to maintain the concentration required to read a book. School texts are not read—if they are, the child's mind may wander so much that little of the content is retained. Poor concentration is the reason why reading comprehension is a particular weakness for children with ADHD.

While reading is difficult for such a child, there is no task more taxing for poor attentional mechanisms than writing. Writing provides little immediate gratification: letters must be formed on the page one after another with no immediate reward. It is a tedious process and children who are easily distracted often feel writing is a form of mental torture and they will go to great lengths to avoid it.

Some children with ADHD can concentrate reasonably well on their schoolwork but lack attention to detail. This becomes a more significant problem as the child advances through school, where the work becomes more complex and subtle distinctions and inferences become more important.

## Impulsivity

The impulsivity of many children with ADHD can interfere with learning. Inability to reflect and to plan ahead leads to carelessness that can be a significant handicap in solving mathematical problems. In other subjects, too, the child's work may be compromised by a

failure to stop and think. Impulsive children will answer a question without first giving it careful consideration.

Impulsivity impairs logical and sequential thinking and organization. Children with impulsivity may also be ‘slap-dash’ in the way they carry out their work; they often have a ‘near enough is good enough’ approach to their homework and school assignments.

## Working memory impairment

The poor working memory of children with ADHD is an important cause of learning impairment. As described in Chapter 1, working memory is a temporary (short-term) store for information. By utilizing his working memory, a child can understand the present in the light of his past knowledge; he can also keep in mind the steps of a plan while he implements it.

Poor working memory leads to difficulties in understanding texts, in carrying out multipart instructions, in planning written work, and in solving mathematical problems that require logical thinking. A child with a poor working memory will struggle to understand the text he is reading because his mind cannot hold the part of the story he has already read while he continues reading. The parts of the story do not connect, and no sooner has he finished a page than it has been forgotten. He will, therefore, complain that the story makes no sense, or is ‘boring’. He will find reading unrewarding and avoid it.

When given a series of instructions, a child with a poor working memory will not be able to hold them in his mind. He will forget the last steps of the task. Difficulties with sequencing may be related to poor working memory or, as described earlier in this chapter, to impulsivity.

Perhaps the greatest area of difficulty for children with poor working memory is in expressing themselves in speech (oral expression) or in writing (written expression). Their stories and speech are disorganized and incoherent. They often get lost in irrelevant detail and so become side-tracked and fail to create a logical progession from start to finish.

Poor working memory is also implicated in reading (decoding) and spelling (encoding) difficulties in children with ADHD. Working memory plays a critical role in the early stages of learning to read and spell. This is when the brain is establishing a store of remembered words (lexicon) that must be accessed during the process of reading and spelling.

## Defiance

Children with ADHD who are badly behaved in class will underachieve academically. This becomes a more significant problem in the last years of primary school or the early years of senior school when the hormonal changes of puberty compound the defiance associated with ADHD.

A defiant child will respond poorly to authority figures, such as parents and teachers. Such a child will rebel against teachers who are overbearing, who teach subjects in which the child is weak, or who teach in a style that is not suited to the child (e.g. a teacher who expects pupils to take down notes from dictation will not suit a child with poor auditory attention). Adolescent boys with ADHD are often particularly averse to taking instruction from a female teacher.

A child with ADHD will frequently develop an intense dislike for a particular teacher and then do little or no work for that teacher. By contrast, he may work well for a teacher he admires. While it is true that most children without ADHD also work better for teachers they like than those they do not, it is the *total* lack of effort for a disliked teacher, and the refusal to modify this response, that is characteristic of the child with ADHD.

Unfortunately, when a child misbehaves at school, his academic progress may be further impaired by attempts to discipline him. This occurs, for example, when he misses schoolwork because he is sent out of class or is suspended from attending school.

## Low self-esteem

Low self-esteem is commonly present in children with ADHD and is a factor that may impede their academic progress. Once a child's confidence in his ability is compromised, it becomes difficult for him to apply himself to his schoolwork. He will not make an effort to learn if he feels despondent about his chances of success. He will try to avoid embarrassing failures by strategies such as playing the 'class clown' (to cover up his academic difficulties), disrupting the class, refusing to go to school, truanting, and failing to hand in his work.

Because of the adverse effect on self-esteem, repeating a class usually has a negative impact on the educational progress of children with ADHD. Low self-esteem also makes a child with ADHD respond particularly poorly if he feels that he has been humiliated in front of his peers by a teacher.

## Social difficulties

Some teachers, particularly in the early school years, place great emphasis on group projects. Unfortunately, many children with ADHD work poorly in groups. They lack the 'give-and-take' necessary for group cooperation. They tend to be egocentric and overbearing with their peers. These characteristics, together with their inflexibility and low frustration tolerance, often lead to altercations in group work. If such work is an important component of the educational programme, a child with ADHD may run into difficulties that interfere with his academic progress.

## Poor incentival motivation

Progress in high school requires many hours of tedious study for a reward that may not be enjoyed until several years later. To succeed in high school, a child must be prepared to defer immediate gratification for later intangible rewards, such as high marks on his report card.

As described in Chapter 1, this degree of forward planning and gratification deferment requires incentival motivation, an area of great difficulty for a child with ADHD. Children with the condition generally respond to their difficulties by blaming the work ('It is boring!') or by reducing their expectations and so underachieving academically.

These children tend to put off tasks to the last minute. Only when they are under a great deal of stress will they sometimes be able to work. This makes the problem difficult to distinguish from lack of willpower, but a comprehensive assessment (see Chapter 11) will uncover the nature of the child's difficulties.

## Auditory processing impairment

Auditory processing deficits are common in children with ADHD. These deficits impair the ability of these children to make sense of what they hear. Their brains may not efficiently discriminate similar sounds from one another, retain words in the order they are spoken, or comprehend the meaning of language.

A child with auditory processing impairment will misunderstand instructions and so become confused by a teacher who teaches by talking a great deal. Often such a teacher will question whether the child has a hearing impairment because of his difficulties understanding the spoken word; however, an ordinary hearing test will be normal if the problem is due to an auditory processing deficit.

Special tests of auditory discrimination and processing, performed by a psychologist or speech therapist, will uncover the true nature of the child's difficulties.

### Spelling difficulties

Children with ADHD often experience difficulties with spelling. There are basically three types of spelling error seen in the work of these children:

1. *Visual errors*. These errors sound correct but look wrong. Examples are 'lite' for 'light' and 'grate' for 'great'.
2. *Sequential errors*. These cause mistakes such as 'brigde' for 'bridge'.
3. *Phonetic errors*. These errors will have some visual resemblance to the correct spelling, but sound different when read; for example, the child may write 'lap' for 'lip' or 'goase' for 'goose'.

### Handwriting difficulties

Children with ADHD are often poorly coordinated and are clumsy when manipulating objects (poor fine-motor skills). Handwriting is often slow and untidy in children with the disorder. If a child can perform any of the actions involved in forming letters in isolation but cannot carry out these actions in an uninterrupted sequence when writing, the difficulty is known as 'motor dyspraxia'. The handwriting of a child with motor dyspraxia is slow and untidy.

### Organizational difficulties

Organizational skills are poor in most children with ADHD. This will have a negative impact on their schoolwork, particularly in their high school years when teachers expect and demand a great deal of self-sufficiency from their pupils. Even bright children with ADHD will obtain poor marks if they forget to bring work and books home, fail to plan ahead for projects and study, and fail to hand in their work for marking.

## Dyslexia and ADHD

Dyslexia is a specific difficulty in learning that interferes with a child's ability to learn to read. It occurs because of an abnormality in brain function that is usually inherited. Although dyslexia can be an isolated problem in a child, it is much more common in children with ADHD

than in children who do not have ADHD (see the section on 'Comorbidity' in Chapter 1).

When a well-behaved child with dyslexia has the inattentive form of ADHD, his learning difficulties may be incorrectly ascribed to the dyslexia alone. This occurs because many parents, and even some professionals, regard ADHD exclusively as a behavioural problem. They make the mistake of thinking that a child's good behaviour excludes ADHD.

If a child who has dyslexia and ADHD receives remedial teaching alone, he will usually make little or no progress because impairments in working memory and attention to detail will continue to block learning. With time, the child's self-esteem diminishes, and it becomes even less likely that he will overcome his difficulties. In such a child, it is often only when medication to treat the ADHD is *combined* with the remedial programme that real progress is made and maintained.

Such children usually need a small dose of medication to cover school days only. A dramatic improvement in the child's self-esteem and academic progress is often noticed in a matter of days after commencing treatment.

## The gifted child with ADHD

Since ADHD is unrelated to intelligence, the proportion of gifted individuals is no different among those with ADHD than those without. The presence of ADHD, however, presents three special problems to gifted children.

First, the performance of gifted children is sensitive to even mild degrees of ADHD. It seems that small impairments in working memory and organizational skills have a disproportionately severe impact on the performance of a gifted child. Such children may not score below average in their areas of difficulty—they may only score significantly less well than they do in other areas. It is, therefore, important that treatment of ADHD be considered in any gifted child who is experiencing academic difficulties, even if tests show mild degrees of the impairment.

Second, in a gifted child who has ADHD, both the giftedness and the ADHD may be missed. This occurs when the learning impairment associated with the ADHD reduces the child's academic performance from above average (where it should be) to an average level. Parents and teachers may be satisfied that the child seems to be performing

in the average range of performance without realizing the child's true potential. Only an astute parent or teacher will suspect that the child is underachieving. A comprehensive assessment, as described in Chapter 11, will uncover the true nature of both the child's gifts and his disability.

Third, in some gifted children with ADHD who are underachieving, the child's exceptional gifts may be detected, but the presence of coexisting ADHD missed. This occurs when the child's underachievement is wrongly ascribed to boredom, 'overexcitability',[1] or lack of motivation. Such explanations should never be accepted without a proper assessment to exclude other causes of the child's underperformance.

---

[1] The characteristics of 'overexcitability', described by the Polish psychologist Kazimierz Dąbrowski in 1964, have been incorrectly regarded as a normal accompaniment of giftedness. Dąbrowski was simply describing ADHD under a different name and the characteristics he described are no more common in gifted children than children of average intelligence. The term 'overexcitability' should be abandoned.

# 6

# Defiance

## Key points

- Approximately one-quarter of children with ADHD experience significant difficulties in conforming to rules and regulations appropriate for their age.
- Parents of such children quickly learn that smacking and other forms of punishment are ineffective.
- Performance inconsistency, which is a prominent feature of ADHD, is often misinterpreted as implying that the child could succeed if only more effort were made.

Approximately one-quarter of children with ADHD experience significant difficulties in conforming to the rules and regulations appropriate for their age. These difficulties are usually seen both at home and at school, although some children can cope with a structured situation at school and experience all their difficulties in the home setting.

This defiant behaviour is often misunderstood by observers, who think that there must be something wrong with the way that the parents are disciplining their child. Parents of such children often report that their friends, as well as strangers, will make suggestions, such as ‘You are not being tough enough’, or ‘If you gave him a good hiding, he would stop doing that’. Unfortunately, the management of defiant behaviour in children with ADHD is not so simple.

## Compliance—a function of the brain

Normal toddlers have great difficulty complying with their parents’ instructions. The phrase ‘terrible twos’ is widely used to describe the great difficulty that children have between the ages of about 15 months and three years in obeying parental commands. At that stage

of development, the brain is simply not mature enough to allow the child to inhibit self-centred needs, to delay gratification, and to conform. Here, the brain has not yet developed its mechanism that we generally call 'conscience'. Children of that age cannot put themselves into someone else's place and understand how their behaviour may affect others. They simply act out their feelings and do the things they feel they want to do, without regard to the consequences.

As the brain develops, this lawlessness is inhibited by the increasing activity of the frontal lobe. It has been known for a long time that adults who sustain damage to the frontal lobes of the brain can start behaving in a defiant, non-compliant manner (just like a toddler).

In many children with ADHD, the necessary frontal lobe mechanisms for compliance with rules and regulations develop slowly. This means that, although the child is in an ordinary home and ordinary school, he cannot conform like other children of his age.

Our society has great difficulty in accepting this. We feel uncomfortable with the idea that children who are behaving poorly may be doing so because of a brain disorder. We like to have someone to blame for the child's difficulties and we usually focus on the child's parents.

In fact, children with ADHD with non-compliant behaviour have parents who are just as competent as other parents. They are usually unable to manage or discipline their extremely difficult child. Having raised the defiant child's siblings (who do not have ADHD and do not have behaviour problems) and based on this previous experience, many are at a loss to know how to deal with a child who does not respond to the usual methods of discipline.

Parents of such children quickly learn that smacking and other forms of punishment are ineffective. Therefore, they are forced into passive acceptance of much unwanted behaviour, which seems only to confirm the casual observer's view that they are being too lenient. Such observers often do not realize that the parents have been forced to become lenient because other strategies have failed. At this point, smacking their child or using 'time out' whenever a misdemeanour occurs would mean smacking the child continually, or the child spending most of his waking hours locked in his room.

Another aspect of such children's behaviour is its variability. This also leads to misunderstanding. For example, an eight-year-old with ADHD, who has the compliance control of a two-year-old, will be highly inconsistent in the way in which she behaves in different

situations. Therefore, parents often use the term *Jekyll and Hyde* to describe their child. It is not simply that the child is never compliant. At certain times, for example, when he is not tired or when he tries extremely hard, he will be successful in behaving well. However, he cannot maintain this for protracted periods of time, or in all the situations that apply to a child of his age should be able to. It is not uncommon for the child to be better with one parent than the other for reasons that are not apparent.

Unfortunately, such performance inconsistency, which is a prominent feature of ADHD, is often misinterpreted as implying that the child could succeed if only more effort were made. This is analogous to saying that because a child with heart disease can walk 15 metres without becoming breathless, he should be able to run a marathon, if only he tried hard enough. It is the difficulty with *sustained* performance that shows up the problems of the child with ADHD, in the same way as it does for the child with heart disease. Sustained performance is the true test of the competence and maturity of the brain functions that are impaired in children with ADHD.

Observers may think that children with ADHD should be able to comply with rules because the children know and understand them. But ADHD is a *performance* disability, not a *knowledge* disability. Children with ADHD usually know what they should do and should not do; they simply cannot consistently do the things that they know they should.

## Severity of defiant behaviour

Non-compliant behaviour in children with ADHD can be divided into two forms. The more common, milder, form is known as oppositional defiant disorder, while the more severe, fortunately rarer, form is known as conduct disorder.

### Oppositional defiant disorder

Approximately 20% of children with ADHD have oppositional defiant disorder. Such children demonstrate several behaviours, which are discussed next.

#### Active defiance

Children with oppositional defiant disorder will flout rules. They often refuse to do their homework, to carry out household chores, or to conform to requests such as wearing a complete school uniform. Any

child without ADHD may defy adult instructions, but children with oppositional defiant disorder do this in a far more extreme way, persisting despite repeated punishment.

### Argumentativeness

Parents will often say that, with the child who has oppositional defiant disorder, 'Every discussion is an argument'. Often the only communication between parent and child is in the form of arguments. Children with oppositional defiant disorder will characteristically argue with all adults, including teachers and even strangers, in a way that other children of the same age would not.

### Temper outbursts

Children with oppositional defiant disorder have temper tantrums of the kind that are usually not seen in children of school age. Rather, these tantrums resemble those seen in toddlers.

Often parents will report that their child will be reasonable until any of his desires are thwarted or frustrated in any way. He will then suddenly have a temper tantrum, kicking walls, slamming doors, and shouting. If put in his room for *time out* (see Chapter 14), he may destroy his possessions. Some will even escape through the window.

The temper tantrums may be so sudden, and so out of proportion to what has happened, that parents may think the child is having some form of seizure. An unusual form of epilepsy (*temporal lobe epilepsy*) does have to be considered in any child who has unprovoked temper outbursts; however, in children with oppositional defiant disorder, it is not that the temper tantrum is unprovoked—it is simply that the trigger is so insignificant.

### Touchiness

Children with oppositional defiant disorder are extremely easily annoyed. They will be slighted by the most minor action and then will become angry and aggressive. Once more, it is the frequency and severity of these outbursts that distinguish them from similar behaviour in a normal child.

### Projection of blame

Children with oppositional defiant disorder tend to blame others for their own inadequacies. Any mistake on their part is immediately attributed to someone else, such as a parent, a teacher, or a friend. This is referred to as finding an *external locus of blame*.

### Resentfulness

Children with oppositional defiant disorder often deeply resent any authority figure. They will therefore complain bitterly about anyone who tries to discipline them. They may be quick to develop a deep hatred for authority figures they come across.

### Swearing

Even from an early age, children with oppositional defiant disorder are quick to learn swear words. They will often use obscene language in a situation where a child of their age would know that this is not appropriate. The best way to handle swearing, after initially pointing out that it is inappropriate, is to ignore it, but this often does not resolve the problem in these children.

## Conduct disorder

Conduct disorder is more severe than oppositional defiant disorder and occurs in about 2% of children with ADHD. Conduct disorder differs from oppositional defiant disorder in that the problems attract a greater degree of social disapproval, and often result in the child breaking the law.

The behaviours seen in children with conduct disorder include the following: stealing, setting fires, breaking in, destroying property, cruelty to animals, forcing sexual activity, using weapons, initiating fights, and physical cruelty to people.

Some children will develop conduct disorder early in life, even as young as seven or eight years of age. Most, however, start off with oppositional defiant disorder and then develop conduct disorder in the teenage years. Most are male.

Some children with conduct disorder are the *solitary aggressive* type. These children are loners and carry out their offences on their own. More common are the *group-type offenders*, who are attracted to other children with similar problems. Group-type offenders may behave quite reasonably when on their own but become antisocial when part of their group (gang).

# Treatment of defiant behaviour

## Oppositional defiant disorder

Mild oppositional defiant disorder will often resolve with medication alone. Once a child is on appropriate medication for ADHD, he

usually becomes calmer and his behaviour more compliant. Aggression also decreases.

It is helpful if parents also learn behaviour management techniques, so that they can implement these together with the medical treatment (see Chapter 14).

For children with more severe oppositional defiant disorder, behaviour management needs to be looked at in greater detail. In such cases, it is important that a psychologist is involved to provide parents with appropriate strategies for managing their child's behaviour. These strategies, used in conjunction with medication, will not totally eradicate the behaviours, but will ensure that the child is more manageable and is less likely to do harm to herself or others. It also makes the later development of conduct disorder less likely.

## Conduct disorder

Management of conduct disorder is extremely difficult. There are some children with conduct disorder who will respond positively to medication, so medication should always be tried. Unfortunately, medication does not help many children with conduct disorder. Even in those children where medication is helpful, it can be exceedingly difficult to get the child to take it consistently. Such children often deny that the medication helps them, even when it is quite clear to parents and other observers that it does. Parents may need to exert a lot of energy to ensure that the medicine is taken.

Children with conduct disorder often experiment with alcohol and marijuana, and parents often wonder whether medicines used for ADHD will interact with these. Medicines that are used in ADHD do not interact in any specific adverse way with alcohol or marijuana. However, marijuana and alcohol tend to make children less focused, poorly motivated, and lacking in inhibition, while the medicines used for ADHD make them more focused, better motivated, and less impulsive. Marijuana and alcohol, therefore, undermine the effect of the medicine the child is taking.

It is important that parents of a child with conduct disorder receive counselling to help them develop strategies for coping with their child's behaviour. Most parents will need someone outside the family to talk to about their concerns, and to look at different ways of dealing with their child's behaviour. This could be a psychologist, case worker, social worker, or psychiatrist.

Parents of a child with conduct disorder are in an extremely difficult situation. They want to keep the child out of trouble, but the child

often seems bent on a course of self-destruction. All that parents can do is to try to be available when their child needs them and hope that, with time, the brain will mature and the behaviour settle.

There certainly are no easy answers to questions about the appropriateness of special school units or special residential units for children with conduct disorder. These issues need to be looked at on an individual basis. The decision about whether to involve the police can also be a difficult one when the child's aggression is directed towards parents or their property. If the child's behaviour is placing others at risk, the police will have to be involved.

Individual psychotherapy (counselling) can have a role in some children, but this, like other forms of treatment, is often ineffective. Children with conduct disorder tend to sabotage most forms of treatment.

While some children with conduct disorder will end up in prison, others do undergo a miraculous maturation in their late teens or early twenties and do not get into any further trouble. Many an adult who is now a good citizen had a very stormy childhood.

# 7

# Low self-esteem

## Key points

- Most children with ADHD suffer from a low self-esteem.
- Many unwanted behaviours that are seen in children with ADHD are due to problems with self-esteem. It is essential that parents and teachers recognize this before trying to treat the behaviour.

It is difficult to think of any attribute more crucial to success in life than healthy self-esteem. Whatever abilities a child may have, without a good self-image she is unlikely to succeed. If success does come to an individual with a low self-esteem, it is unlikely to be enjoyed.

Most children with ADHD suffer from a low self-esteem. This may become apparent to the parents when the child makes negative comments such as ‘I am dumb!’ or ‘I can’t do this!’ In some children, poor self-esteem may show itself by excessive moodiness, irritability, tearfulness, or withdrawal. In other children, problems with self-esteem may not be so easily recognized. Difficult behaviours, such as aggression, an excessive desire to control situations, distaste for being cuddled, and excessive quitting, can all be attempts to maintain a fragile self-esteem. It is easy to misinterpret such behaviour as defiant or perverse. Unfortunately, if the origin of these behaviours is not recognized, attempts to correct them may further undermine the child’s self-esteem.

## Self-appraisal—a function of the brain

We all know individuals who have been successful, but who have poor feelings of self-worth, and there are many people who have not

been successful, or who have not had good experiences during their lives, who maintain a positive estimation of their own value.

It seems that there are important mechanisms in the brain that control the way in which children evaluate themselves and cope with things that go wrong in their day-to-day experience. Stella Chess and Alexander Thomas were the first to describe the noticeable differences in temperament that babies demonstrate almost immediately after birth. Studies of alteration of self-appraisal in adults who have undergone brain injuries, as well as after the effects of drugs that act on the brain, give further support to a biological, brain-based component to self-esteem and resilience.

The part of the brain that controls self-esteem is widely believed to be the limbic system, which lies deep within the frontal part of the brain. The frontal parts of the brain receive highly processed and filtered sensory information from other parts of the brain. That information eventually reaches the limbic system, which regulates emotional responses and feelings. As Chapter 10 explains, the frontal lobes of the brain do not function normally in children with ADHD. This would explain why many of the characteristics of self-appraisal in children with ADHD are immature; for example, very young children tend to look for someone or something to blame for things that go wrong. A young child who hurts herself may become angry and aggressive, looking for someone to blame for the accident. She, therefore, projects the *locus of blame* onto a parent or sibling (or even an inanimate object). As children develop, they become less likely to look for a locus of blame for things that go wrong. They can accept the fact that accidents occur, and shrug off difficulties with a reasonable amount of equanimity.

A child with ADHD will often retain this tendency to look for a locus of blame beyond the age where it usually disappears. Misfortune may give rise to anger and aggression directed towards others who were not responsible for what happened.

Children with ADHD will often project the locus of blame onto themselves and, therefore, appraise themselves harshly for things that go wrong. Conversely, if things go well, they may not attribute this to their own ability. It becomes clear that they have not developed an appropriate feeling of autonomy or competence that is necessary for adequate feelings of self-worth. This can be seen in the way in which they respond to their achievements. A normal child who passes an examination will be able to feel good about his or her achievements. A child with ADHD may say something like ‘The

questions were too easy', or 'The teacher gave me more marks because she knows I am dumb!'

With an immature appraisal system, children with ADHD can easily come to attribute negative intentions to other people when these intentions do not exist. They are, therefore, quick to feel threatened and discouraged. It is characteristic of many children with ADHD that they always expect the worst and that they have difficulties in seeing good in others or themselves.

It is easy to see how children with ADHD can become depressed. Depression is a form of anger directed at oneself, and children who project blame onto themselves, and feel that they are not capable or competent, can easily become sad and withdrawn.

Children with ADHD are thus doubly at risk of experiencing problems with self-esteem. First, they have many difficulties in their everyday performance due to their problems with poor attention span, impulsivity, poor social cognition, and difficulties with learning. Therefore, they often experience failure and criticism. Second, they have problems with self-appraisal that lead them quickly to lose feelings of self-worth.

## Control of the self-appraisal system in the brain

We still know little about how the self-appraisal system that controls self-esteem works. However, it seems certain that levels of neurotransmitters play an important role.

Neurotransmitters are chemicals produced at the end of nerves in the brain to send a message from one nerve cell to another. Low levels of certain neurotransmitters are the basic cause of ADHD (see Chapter 10).

Although many people have difficulty understanding how chemicals in the brain can control self-esteem, most people have personal experience of temporarily altering their self-appraisal mechanisms by changing the levels of neurotransmitter in the brain. They do this by drinking alcohol to give them confidence when required to speak in public. This is to be avoided but it does demonstrate that self-esteem is at least partially controlled by neurotransmitters.

## Dysfunctional coping behaviours

Many unwanted behaviours that are seen in children with ADHD are due to problems with self-esteem. It is essential that parents and teachers recognize this before trying to treat the behaviour. Often such behaviours cannot be eradicated without helping the child gain better feelings of self-worth, which is something that may take time.

It is easy to become frustrated with these behaviours and criticize the child. However, criticism only further lowers the child's feeling of self-worth and entrenches the behaviour or may even force the child to substitute other unwanted behaviours.

All these behaviours are attempts on the part of the child to deflect feelings of inadequacy and to prevent those feelings from getting worse. In most cases, the attempts are only partially successful, and treatment should aim to find successful ways of reducing the negative feelings.

The following sections discuss some examples of dysfunctional behaviours, and provide some advice about managing them.

## Quitting

Some children develop a habit of quitting as a way of coping with feelings of inadequacy. When frustrated, for example, because they cannot win a game or accomplish a skill, they will quit. They often will offer an excuse, such as that the task or game was 'stupid' or 'boring'. In both schoolwork and in games, they give up the moment they encounter difficulties and then refuse to continue.

It is no use entering into a discussion with the child about the importance of the activity or insisting that it is not boring. The child's criticism of the activity is simply a smokescreen that she raises to protect herself from failure.

It is important that you make certain that the tasks your child attempts are within her capabilities. If a task or game is difficult, try to find a substitute that is within her capabilities. Try to give her special jobs to do that require a small degree of persistence—then, have a reward system for when she finishes these. In this way she will have the opportunity to learn that persistence does pay. Tell her stories about great people who did not give up when they were facing defeat. Children's libraries usually have books that teach children particular virtues, like courage and persistence.

Most importantly, try to take the tension out of the situation. Make activities as much fun as possible. Join in where possible and show that you, too, make mistakes, but that you do not become upset.

## Avoiding

Avoiding is similar to quitting, except the individual does not even start the activity. Children with ADHD will often not want to join in activities, or to volunteer to take part, for fear of failing. Children with ADHD often refuse to visit a friend, to try for a part in a play, or to put their hand up in class because of problems with poor self-esteem. Their feeling of self-worth is so low that they feel that they cannot afford to fail.

It is essential that such children should not be criticized. They need to be directed towards activities where they are not in the limelight and in which they can succeed.

## Adverse responses to praise

Children with low self-esteem might behave in an adverse way when praised. Instead of enjoying praise, they may become angry or negative whenever praise is given. Because they feel so inadequate, any praise is misinterpreted and regarded as implied criticism. Praise often reminds them of how far they fall below their own expectations and what they believe to be the expectations of the person who is praising them. They interpret the praise as being patronizing and containing implied criticism.

In such a situation, praise should be used sparingly and only when it is clear that the child feels satisfied with her performance. Praise the child's accomplishment rather than the child herself. Wherever possible, encourage the child to praise herself, but do not persevere if she does not feel comfortable about doing this.

## Tactile defensiveness

Children with ADHD often do not like being touched or cuddled. This aversion to touch is known as *tactile defensiveness*. Parents often become hurt at this, believing that the child does not feel affectionate towards them. The truth is that children with ADHD often do not feel happy about being cuddled because of their low self-esteem. Often if a child does not feel good about herself, she will not enjoy being touched. This is because being cuddled makes her feel vulnerable to rejection and because, strange as it may seem to the parent, the child does not feel loved or lovable.

Parents must be patient with children who have tactile defensiveness. They must strike a happy balance between not forcing themselves upon the child, and at the same time trying to

make some physical contact that they hope will increase as the child becomes more confident. Knowing exactly what to do does require an ability to interpret the child's feelings.

Parents naturally want to cuddle and comfort an upset child. However, children with ADHD who have low self-esteem may be best left alone when they are upset; they may feel happiest sitting on their own or retreating to their room. The time to touch the child may be when the child is feeling happier and more confident. Touch should be limited initially, increasing gradually as the child is desensitized. Many children with ADHD benefit from having soft toys or a pet that they can cuddle without fear of rejection.

## Cheating

Some children learn to cope with failure by cheating. This may occur at school, when work is copied, or at home. The child feels so certain that she cannot win a game or pass a test that she alters rules and copies answers.

You should make certain that your child is not being set tasks that are beyond her capabilities. You should also make certain that she is not receiving criticism for her failure. The child should be praised for her effort, even if her work is incorrect.

If teachers spot that a child is cheating, they should only mark the portion of the work that they know the child has done herself and ignore the rest. In this way she learns that she is rewarded only for her own efforts.

It is best if you do not let your child get away with significant lying or cheating. Whenever she is caught at it, ask her if she understands what she is doing. Explain that you admire her efforts whether she succeeds or fails, but that cheating spoils games and work. Talk to her about this, mentioning that you understand why she wants to cheat, but explain how much better it is to be honest. Ensure that honesty is praised. In games, set an example of how to lose gracefully.

## Lying

There are two forms of lying seen in children with ADHD. Some children will lie to get what they want (*offensive lying*). This is to be discouraged and it is important for parents to ensure that children do not gain advantage by telling such untruths.

A more common form of lying seen in children with ADHD is when children lie to get out of trouble (*defensive lying*). This is a form of coping with low self-esteem. It is important not to put your child into a situation where she feels she must lie frequently. Parents should not ask their child if she is guilty when they suspect that she might have carried out some misdemeanour. By continually being put 'on the spot' in this way, the child is forced to lie to 'save face'. It is better if you only criticize your child when you know she has done something wrong. In such a situation it is unnecessary for you to ask whether she was guilty or not.

In those situations where you do not know if she has done something wrong, it would be better not to ask her difficult questions, whenever possible. Defensive lying often quickly resolves when parents cut down on the amount of cross-examining that they do.

## 'Amnesia'

Akin to defensive lying is the tendency for children with ADHD who have done something wrong to claim, after the event, that they cannot remember the incident. Sometimes parents worry that a child who has had an extreme outburst of anger may have had some sort of seizure. When the child denies all memory of what she did during the outburst, the parent may think that this is further evidence that the episode was a seizure. Often the child with ADHD is simply feigning amnesia as a way of avoiding having to take ownership of the way she behaved. This may even be a subconscious suppression of the memory, and the child may in fact not be lying.

## Clowning

Children with low self-esteem will often play the part of the clown to gain attention and feel good about themselves. They will also feel that they can avoid activities in which they may fail by playing the part of the incompetent. Often children will inadvertently say something funny in class and then, when they realize the approbation that this brings, will continue to play this part. Other children are often only too willing to let the child with ADHD make a fool of herself in this way. Unfortunately, clowning rarely wins true friends for the child and makes her susceptible to ridicule. She may then find it difficult for other children to take her seriously when she wants them to.

Clowning is usually seen in the classroom and it is important that teachers tackle this appropriately. Punishing the child who plays the part of the clown only decreases her self-worth and encourages

further subversive clowning. Rather, the teacher should try to stop the other children from laughing at the child and thereby reinforcing her behaviour.

## Regressive behaviour

Children often behave in an immature fashion as a way of coping with stress. Children with ADHD who have self-esteem problems may behave in a babyish way because they are frightened of failing. By adopting a childish manner, they subconsciously hope to convey the impression that they are too young to be criticized for their failure. They tend to persist with this behaviour if it is successful.

A certain amount of regressive behaviour can be accepted, but if it is obvious that the child is behaving in a babyish way too often, parents should make certain that mature behaviour is praised, and that regressive behaviour ignored and discouraged.

## School avoidance

Children with ADHD may avoid going to school. This may take several forms. The child may flatly refuse to leave home, frequently complain that she is ill, pretend that she is going off to school but never arrive, or leave school during the day by absconding or saying she is ill.

Those who complain of being ill may be feigning illness, or they may be so anxious about going to school that they experience stress-related symptoms, such as abdominal pain and headaches. This sort of school avoidance is usually due to distress about academic or social difficulties. She may be frightened of failing or of being teased or ostracized. Sometimes a child tries to avoid particular lessons, for example, mathematics in the case of a child with particular difficulties with arithmetic, or physical education in a clumsy child. Parents may see a pattern in the days the child misses.

A distinction should be drawn between this sort of school avoidance and the intense fear of school (school phobia) that is often associated with issues related to leaving home, rather than anxiety about school itself.

If your child is avoiding school, speak to her about it. You should also speak to her teacher to see if there are academic or social stresses that can be reduced. It is important to prevent school avoidance becoming a regular pattern of behaviour. If you feel that your child is feigning illness, do not give her excessive attention. Give her bland

food when she is at home and do not let her spend time watching the TV. Be matter of fact and encourage attendance at school, even if only for half the day. It is important to keep in touch with the school and have work sent home, which she is expected to do. There should be a clear expectation that she will return to school at the earliest possible opportunity.

If these simple measures do not work, it is best to involve your child's doctor or a psychologist. This is particularly important if your child is refusing to leave her room or if she is withdrawn.

## Homework avoidance

Homework avoidance often leads to a great deal of conflict between parents and children with ADHD. If your child is not completing her homework, you should first check whether it is too difficult, or too much, for her. If so, speak to her teacher about this.

If the level and amount of homework is appropriate, but your child is still having difficulties, you may need to look at how she goes about the work. Do not be tempted to do the work for her but help her learn to organize herself efficiently. You will need to look at when she does the homework, where she does it, and how she arranges the time to do it.

It is usually best if there is a specified homework time. For some children with ADHD, this may need to follow a chance to burn off energy in active play. For other children, it may be better to leave the play as a reward for after the homework is completed. Whichever time is chosen, there should be some specified reward for when the work is completed. The child needs as quiet an environment as possible. Many children work best if there is a parent nearby, even though the parent may not need to take an active part in helping the child. For such children, the parent's presence has a settling effect. Homework should not go on for too long. If there is a lot of work to cover, or if your child is slow, it may need to be broken up into a couple of sessions.

It is important that you teach your child how to manage her time effectively. She needs to know how to arrange work according to priorities, and how to work systematically. Teach her not to expect you to do all the work for her, but to think of you as a resource that she can call upon when she needs advice.

Children may need help if a project needs to be completed over a long period. Help your child to break this into stages and to create a

timetable for completing each stage. Without this help, things will often be left to the last minute and the child then feels overwhelmed.

## Video game and TV 'addiction'

Parents of children with ADHD often complain that their child spends a great deal of time playing video games and watching TV. Video games do not require the use of the attentional systems of the brain that are impaired in ADHD. Brain scans show that the back parts of the brain, unaffected in the condition, are activated when these games are played. In addition, difficulties with academic work, as well as with social relationships, mean that solitary activities are a compensatory diversion for this group of children.

Limiting the amount of time devoted to these activities is only part of the answer. It is important to find rewarding substitute activities. You may be able to find after-school activities for your child, based on her interests. Keep an eye on local newspapers and talk to other parents to find out about suitable activities for children. You may also obtain information from local sports and recreation centres. If your child is having difficulties making friends, she may benefit from attending a social skills group. You need to check with your local health centre whether one is being run in your area. You may also need to take an active role in contacting other parents to arrange playdates for your child.

## Aggression

Aggressive behaviour is a common cover for low self-esteem. A child who feels that she has failed may vent her anger on others. A child who does not feel good about herself may derive satisfaction by exerting power over others. Such a child may get into fights, bully other children, or engage in arguments and make critical remarks about siblings and others.

Listen carefully to what your child says when she insults others; she is probably echoing the criticisms that hurt her most. If this is the case, you need to check on why she feels that she is being criticized in this way and take steps to stop it. Check whether she is being victimized at school; she may be part of a pecking order and simply acting out the aggression she is experiencing.

Determine whether she is behaving aggressively only in certain situations and see if you can identify what provokes the behaviour. Often outbursts occur at times when your child experiences a failure, or threat of failure. It may be possible to avoid such situations, or to

change things so that your child does not feel inadequate. Frustration tolerance can be lowered in a child is hungry or tired. It is therefore important to ensure that a child who is frequently aggressive or angry is getting enough sleep and eating an adequate amount of food and a balanced diet.

For some children, it may be necessary to arrange a reward system for not losing their temper.

You should also teach your child strategies for coping with her aggressive feelings. She may go for a walk, jump on a trampoline, or listen to music. Sometimes a child will benefit from a punch bag, or even a pillow on which she can vent her anger. Encourage her to express to you the way she feels and accept these feelings with sympathy. The technique of 'active listening' is often helpful and is described in the book *Parent Effectiveness Training: The Proven Program for Raising Responsible Children* by Dr. Thomas Gordon.

If aggressive outbursts remain a problem despite these measures, it is a good idea to seek help from your child's doctor or psychologist. If the habit of resorting to aggressive outbursts becomes ingrained, it may be difficult to eradicate later and may cause much trouble in adulthood.

## Controlling behaviour

Many children with low self-esteem feel that they have so little control over their own lives that they feel quite helpless. Some children respond by trying to command and dominate others. They tell people what to do, defy adults, and generally seek to dominate and control situations.

The best way to manage such behaviour is to give the child some areas where she does have control, for example, choosing her clothes, helping to select items at the supermarket, and deciding how to spend her pocket money (within reason!). Allocate some pleasant task that becomes her responsibility and reward her for doing it. Explain that certain tasks are her domain but that others are not.

When giving instructions, do this in the form of choices whenever possible: 'Do you want to tidy up your room while I do the lounge, or will you do the lounge while I do your room?' This is less likely to make her feel that she is losing autonomy.

## Passive aggression

Some children with ADHD develop behaviour that is passively aggressive. There is no overt aggression, but the child subverts attempts to control her; for example, she will promise to meet certain responsibilities, but then 'forgets' to do so. She may sabotage attempts by parents to achieve goals by failing to turn up to planned activities when required. Such children avoid confrontation but make it extremely difficult for parents to control them.

Management of passive aggressive behaviour combines techniques described in the two previous sections 'Aggression' and 'Controlling behaviour'. Children with passive aggressive behaviour should be given more control over their lives and allowed to express their anger verbally. Sometimes such children need individual counselling, so that they can express their suppressed feelings of anger.

### Denial

Another behaviour that is commonly seen in children with low self-esteem is a tendency to deny difficulties. In this way they can deal with the feelings of hurt that may result if they were to acknowledge their limitations and vulnerability. When asked about their concerns they will simply state that they do not care about things, or that things are going well. Once more, counselling may be needed to help such children talk about their difficulties.

## The importance of self-esteem maintenance mechanisms

The behaviours discussed in this chapter are strategies that all children use at some time to maintain their self-esteem. Children with ADHD are different in that they are more likely to use these mechanisms in a counterproductive way. They are not thought out by the children but are strategies encountered by accident and then recruited as part of their protective shield. In all cases, they are attempts by the child to maintain his or her feeling of self-worth.

The primary aim of any treatment should be to maintain the child's feeling of self-esteem. One can, therefore, not simply remove these defence mechanisms without putting something else in their place.

# 8

# Social clumsiness

Key points

- To acquire age-appropriate social skills, certain parts of the brain need to develop normally.
- Lack of friends may make the child behave in an even more inappropriate way to gain attention.

Children with ADHD may experience social difficulties because of features of their condition, such as overactivity, impulsivity, and low self-esteem. In addition, many children with ADHD have a limitation in the way in which their brain understands and responds to social conventions. This is called a social cognition deficit.

## Social cognition—a function of the brain

Much of what children learn about socially appropriate behaviour is not actually taught to them; they simply pick it up as they go along. For them to do this, certain parts of the brain need to develop to an appropriate maturity for the child's age. The child with ADHD seems to have an immaturity in the part of the brain responsible for social cognition and so is less able to learn socially appropriate behaviour, even when taught. Such a child has trouble in behaving in a way that is socially appropriate for his age.

The people who are most likely to notice are the child's contemporaries and, as a result, his peers often reject him. With his peers, such a child often stands out as clearly different. Some are victimized and bullied. They often have a high profile because of their inappropriate behaviour. It is common for such children to be known by everyone in the school, but to have no friends.

Lack of friendship may make the child behave in an even more inappropriate way in order to gain attention. This is often the reason

why such children will play the part of the ‘class clown’ or engage in provocative or eccentric behaviour.

## Specific social competence deficits

*Social cognition deficit* describes deficits in several areas of social competence. A child with ADHD may have one or more specific deficits.

### Social blindness

A socially blind child has difficulty in reading a social situation so that his behaviour can be adapted accordingly. Children with this difficulty do not pick up the same social cues as other children of the same age. For example, they are likely to rush into a social group and start talking whereas others would understand that the group should be approached in a quiet manner, and that they should watch, wait, and listen first.

### Egocentricity

It is a characteristic of young children that they tend to be very self-centred. Children with ADHD who have a social cognition defect will often behave in an egocentric way that is immature for their age. This will show itself in bossiness with their peers. They want to dictate which games are played and insist on making, and often changing, the rules. They lack the degree of give and take that is appropriate for a child of their age.

### Lack of appropriate inhibition

As normal children get older, they become more self-conscious and acutely aware of the need to behave in an appropriate manner for their age. Children with ADHD may not develop such awareness and remain uninhibited. They may undress in public without the embarrassment that their peers would experience. They may be over-friendly to strangers. They may kiss classmates at an age when this is no longer appropriate. They may touch peers in a way that is not appropriate. None of these behaviours is carried out with any malice, but they evoke strong negative reactions. Some children with ADHD make unusual sounds in public, such as imitating animal noises, to attract attention. This may irritate their peers.

## Insatiability

This behaviour describes the tendency of children with ADHD to behave in a certain manner without knowing when to stop. Such a child will be clearly differentiated from his peers, who know when enough is enough.

## Insensitivity to style and convention

Children with ADHD are often not aware of those things that are considered essential for acceptance by their peer group. They may not notice appropriate dress or speech. They will then appear to be eccentric.

Children of a particular age generally use certain slang words and specific ways of expressing themselves that constitute *child-speak*. Children with ADHD may have difficulty learning age-appropriate *child-speak* and may speak, instead, in a way that sets them apart from other children of their age. They may not be as quick as other children in adapting to changes in style, so that they are still wearing last year's fashion when their peers have discarded it.

## Lack of responsiveness

Many children with ADHD are incapable of being receptive to other children's social initiatives. This is due to their egocentricity, which makes them unable to subjugate their own desires to take the desires of others into account.

## Over-talkativeness

Because of their impulsivity and social immaturity, many children with ADHD have great difficulty being quiet. When they are anxious in a social group, they become particularly talkative. Such garrulousness is quickly picked up by other children as being abnormal. It also means that the child is often too self-disclosing, talking about his own feelings and vulnerabilities. This may encourage other children to bully and victimize him when they sense his weakness.

## Poor metalinguistic skills

A particularly important area of development in children of school age is around metalinguistic skills. This is the ability to analyse and reflect on language itself. Children with difficulties in this area will not be as competent as their peers in understanding metaphors, idioms, riddles, puns, jokes, and many other linguistic devices and nuances.

Children with difficulties in this area will not be able to keep up with their more sophisticated peers. They will not understand jokes and may respond literally to the everything that their peers say.

## Difficulties reading facial expression

Research has shown that children with ADHD often have great difficulty 'reading' facial expressions and may be oblivious to whether someone is angry or upset with them. They may, therefore, not modify their behaviour according to another person's response.

Studies involving normal teenagers has shown that facial expressions are interpreted in the frontal lobes of the brain, which is the part that does not function normally in individuals with ADHD.

## Aggressive tendencies

As children grow older, they are more likely to resolve conflicts peacefully. Children with ADHD, particularly those with oppositional defiant disorder, tend to resort to verbal or physical violence when frustrated. They lack the normal aptitude for settling a disagreement amicably. This makes them unpopular.

## Lack of judgment

Children with ADHD may get themselves into all kinds of problems because of a lack of judgment. Often, they will fight with children who are clearly larger and stronger than they are. They may try to establish friendships with children who dislike them and whom they should leave alone. They may persist in annoying another child to the point where they receive a negative response from the whole group.

## Poor understanding of group dynamics

Many children with ADHD will manage well playing with one child at home. However, in the playground, where children often group together, they will experience great difficulty. This may be because of problems with understanding group dynamics. Relating to other children as part of a group requires a subtle understanding of human relationships that is extremely difficult for a child with this kind of social cognition deficit.

## Misinterpreting feedback

Children with ADHD may misunderstand the cues that they receive from their peers. They may be insensitive to whether they are

receiving negative or positive social feedback when relating to other children.

### Tactlessness

Children with ADHD are often tactless. Without intending any harm, they will blurt out inappropriate or hurtful statements. They are unable to understand that things should not be said in certain situations. Because of their difficulties in predicting outcomes, they are often surprised by the negative reaction that their behaviour evokes. Sometimes they do not even notice other people's disapproval or hurt.

### Poor social prediction

Children with ADHD have great difficulties predicting the consequences of their actions. They typically have little or no insight into how differently they are perceived. Unfortunately, this makes it difficult for them to learn the skills that are required to mix with other children.

### Poor social memory

The lack of the ability to recall prior social experience makes it hard for children with ADHD to benefit from experience.

### Lack of awareness of image

Children with ADHD will often not be able to present themselves to peers in a socially acceptable way because they are unable to see themselves as their peers view them.

### Poor behaviour-modification strategies

It is important for children to be able to understand and reinforce the feelings of their friends. Children with ADHD often have difficulty with this because they are not in tune with their peers' feelings and lack the strategies for reinforcing responses.

## Management of social clumsiness

Children with a social cognition defect have a part of their brain that is immature relative to their peers. They want to be liked and to be socially successful, but they do not yet have the ability to learn the necessary techniques.

It is all too easy to believe that helping a child with a social cognition defect is simply a matter of teaching strategies. It is important to understand that, in many children with ADHD, one is dealing with a brain that is not yet ready to learn these strategies.

No amount of social skills training will help a child to behave in a socially appropriate way if he is not yet ready to understand and, more importantly, to *apply* such skills. It is characteristic of children with this sort of difficulty that they may be able to behave in an appropriate way in a structured social skills group, but then have difficulty applying such behaviour in their day-to-day interactions.

Wherever possible, parents should try to help the child by modifying the environment in which he finds himself. Occasionally a change of school may be helpful; however, because the problems lie with the child, difficulties with social relationships may reappear in the new setting.

Parents may need to take an active role in arranging for another child to play with their child after school. Parents can also play a role by tactfully pointing out ways in which the child could win friends. It may be helpful to rehearse certain situations with your child so that he learns how to act in them. This should be done so that it is an enjoyable experience.

It is important to try to identify the particular aspects of social interaction that are causing difficulties. For example, a child with difficulties understanding dress styles and with a poor awareness of his image may need his parent to keep an eye on appropriate fashions and to ensure that he is dressed in a way that blends in with his peers.

Some health centres and adolescent units run social skills training groups where children of all ages learn to understand the social consequences of their actions. They can also acquire techniques for interpreting social cues and for being accepted by their peers.

Cognitive training may also be helpful. In this form of therapy, the child is given one-to-one counselling by a professional trained in social skills development. The child can be taught techniques, such as to stop and think before acting. He is taught first to stop, then to focus and look at the possible ways he may act, and then, thirdly, to act according to a plan. The child is taught, lastly, to evaluate what has happened. Children who are well motivated may respond to this sort of help.

Medication can be extremely helpful to a child with a social cognition defect and may be used alone or in conjunction with another treatment. The medicines used for ADHD will often improve behaviours that impair social relationships, such as disinhibition, impulsivity, garrulousness, and aggressive tendencies. Research has shown that children with ADHD are rated more positively by their peers when they are on medication.

## Autism spectrum disorder

The social cognition deficits described earlier can cause significant difficulties for a child with ADHD. However, in a small proportion of children with ADHD, their social difficulties are too severe to be explained by ADHD alone. Such a child may have an additional condition.

An important cause of social impairment that may coexist with ADHD is *autism spectrum disorder*. The disorder includes the word 'spectrum' because the condition varies from a mild form (formerly known as *Asperger disorder*) to more severe forms. Asperger disorder was named after Hans Asperger, an Austrian psychiatrist.

Autism spectrum disorder is associated with ADHD more often than can be explained by chance alone. This association (comorbidity) occurs because the two conditions share several causative genes. The phenomenon of comorbidity in ADHD is explained in Chapter 1 and the genetic aspects of this are explained in Chapter 10.

### Making the diagnosis

There is no test for autism spectrum disorder. Checklists of the characteristic features are useful, but do not replace the opinion of an experienced professional. The diagnosis should be made by a developmental paediatrician or a child psychiatrist.

The diagnosis of mild autism spectrum disorder is not always an easy one to make. Sometimes the features are not evident when the child is young and become apparent with the passage of time. Many normal children have some degree of eccentricity and difficulty in understanding social cues. These problems do not necessarily imply that a child has autism spectrum disorder.

### Features

Autism spectrum disorder is characterized by severe social cognition difficulties, as well as a restricted range of interests and activities. Not every child with the disorder will have all the features of the condition.

**Poor social skills**

The child with autism spectrum disorder's social interactions with his peers are poor. He may make little eye contact when talking to another person. His interactions may lack reciprocity (back and forth exchanges). His facial expression may be unvaried with little indication of emotion. He may not be able to make his wishes known with his eyes alone.

He may be a 'loner', showing little spontaneous enjoyment in interacting with others. He may be unaware of the feelings and needs of others. His social relationships may be one-sided and his perspective egocentric. He may show little emotion in many situations.

**Unusual speech**

His speech may be stilted and pedantic—as if he is giving a lecture. He may speak about his own interests with little insight into whether he has chosen an appropriate time and whether the listener is interested. His voice may be monotonous—lacking normal inflexions. The voice of a child with the disorder is often loud and high.

He may be very literal in his understanding and fail to appreciate humour or figures of speech. He may speak about himself in the third person and may use certain words in an idiosyncratic way.

**Tactile defensiveness**

He may not like to be touched or he may only tolerate being cuddled on his own terms without returning the affection.

**Increased and decreased sensitivity**

Some children with the disorder are oversensitive to loud sounds, bright lights, and strong odours. Some have reduced sensitivity to cold and pain. They may insist on wearing inadequate clothing in cold weather. When hurt, they may not seek assistance or comfort.

**Poor self-awareness**

A child with autism spectrum disorder may be indifferent to what other children think of him, never showing embarrassment despite his inappropriate behaviour in front of his peers. Even when taught

appropriate behaviour, he may apply what he has learned in a 'rote' and stilted way.

### Clumsiness and mannerisms

Children with the disorder are often awkward—their gestures large and ungainly.

A child with autism spectrum disorder may rock, fidget, or pace around when concentrating. When excited he may display mannerisms such as running on his toes, moving back and forth in one spot, or flapping his hands.

### Restricted range of interests and activities

He may be very attached to a particular object and refuse to be parted from it, even when going out. He may repeat the same pattern of behaviour for long periods of time each day. Such behaviour may be purposeless (e.g. switching appliances on and off), or may be purposeful but excessive (e.g. watching the same DVD repeatedly for hours on end).

### Inflexibility

He may not tolerate change in his routine. His inflexibility may also extend to what he wears and what he eats. He may be fixated on a particular subject and speak about little else.

### Overreactions to teasing

The eccentric behaviour, naivety, and gullibility of children with autism spectrum disorder often lead to their being ostracized and bullied by other children. They may then become stressed and overreact, perhaps lashing out with uncharacteristic aggression.

## Autism spectrum disorder in adulthood

Characteristics of the condition may decrease with age. Many adults with mild forms of the disorder excel in jobs in fields such as science and technology (e.g. computing) where a subtle understanding of interpersonal relationships is not required. They may also manage well in adult social settings, where eccentricity is better tolerated than in childhood. They are much better in small social groups and may avoid large gatherings.

## Management of autism spectrum disorder

Although there is no specific treatment for autism spectrum disorder, there is much that can be done to assist a child with this disorder. All the suggestions described here for the management of specific social competence deficits in ADHD may be applied to a child with autism spectrum disorder. In addition, there are some special considerations.

It is important that the diagnosis be made so that the child's significant difficulties are understood. This enables parents and professionals to adjust their expectations to take into consideration the child's disabilities and to gain a realistic appreciation of his special needs. The correct diagnosis also enables parents to access the considerable amount of information about the disorder, as well as the special resources for supporting children with the disorder.

Information about assisting a child with autism spectrum disorder may be obtained from books on the condition, internet sites devoted to the disorder, and support groups for parents of children with the disorder. Autistic associations also provide information; however, it is important to realize that autistic spectrum disorder varies in severity and so any specific information provided will not be pertinent to a every child who has the disorder.

A child with autism spectrum disorder may need to be taught to make eye contact, as this does not come naturally. A speech therapist may be able to help with this. Such a therapist may also help the child gain better skills in using language in an appropriate, interactive way. He or she may also assist the child in understanding social conventions and the figurative use of language.

Children who have preoccupations or repetitive and ritualistic behaviours may need to be encouraged to spend their time in more socially appropriate, constructive, and varied ways. A psychologist or teacher trained in helping children with autism spectrum disorder can be of great assistance in advising ways of doing this.

It is important to let the child become used to change. Routines should be varied in a gradual way so as not to distress the child, while at the same time preventing him from becoming too used to routine and set in his ways. He also needs to be distracted away from his obsessions into more constructive activities.

Children with the disorder are often highly anxious and easily stressed. This is because they tolerate change so poorly and because other people's behaviour is so often confusing to them. It is important to protect a child with the disorder from being bullied or provoked by other children. Peers may need to be educated to

understand the child's special difficulties, and playtimes may need to be discreetly supervised. If the child does overreact to stress, his behaviour should be seen in perspective.

In addition to measures to protect the child from unnecessarily stressful experiences, some children with autism spectrum disorder benefit from medication to reduce anxiety and stress. The stimulant medications used in ADHD can also be effective. These are described in Chapter 15 and Chapter 16. Medicines from the group known as SSRIs (selective serotonin reuptake inhibitors) are often effective in reducing anxiety and obsessional behaviour. They are not sedating or habit-forming. The effect of SSRI medicines does not wear off with time.

Another group of medicines known as 'atypical neuroleptics' (e.g. risperidone) can also be effective, but they do have many potential side effects that need to be discussed with the child's doctor. They can cause sedation and an increase in appetite, and their effect may decrease over time.

An appropriate school placement is essential for a child with autism spectrum disorder. Some schools are better than others at adapting to the special needs of a child with the disorder. A smaller school with smaller classes is usually best. The teachers and principal must be understanding with a positive attitude and a preparedness to take advice from expert consultants. The involvement of a psychologist to advise the teachers is helpful.

In some educational systems, the school can apply for special funding to assist in the provision of extra assistance to a pupil with autism spectrum disorder. A supporting letter from the child's doctor, confirming the diagnosis and outlining the child's special needs, will usually be required.

# 9

# Emotional disorders

## Key points

- Emotional disorders in children with ADHD are often difficult to detect.
- The emotional problems that occur in children with ADHD fall into three categories: emotional characteristics of ADHD, reactive emotions to having ADHD, and coexisting emotional disorders.

In the descriptions of ADHD published during the first half of the twentieth century, the behavioural problems associated with the disorder were the first to be recognized. The learning difficulties were identified early in the second half of the century, and the emotional disorders were only appreciated towards the end of the century. This is understandable because the emotional disorders in children with ADHD are often difficult to detect. There are several reasons for this:

- A child's behaviour may hide her emotional state. For example, a child with ADHD may be outwardly aggressive and overpowering, and yet inwardly anxious and depressed.
- Children with ADHD rarely have insight into their feelings and are generally unable or unwilling to discuss these. In fact, their low self-esteem may make them deny their true feelings, if they regard them as evidence of vulnerability.
- The emotional state of children with ADHD often changes as they grow older. For example, a child may first develop depression during adolescence. In such a situation, her worsening mood may be wrongly attributed to the ADHD and the child's depression overlooked.

It is, therefore, essential to be aware of the frequent occurrence of emotional disorders in children with ADHD. If you do suspect that your child has such a disorder, you should raise your concerns with

your child's doctor as early as possible. While a book, such as this one, can be helpful, there is no substitute for an experienced doctor who knows your child first-hand.

The emotional problems that occur in children with ADHD fall into three categories: emotional characteristics of ADHD, reactive emotions to having ADHD, and coexisting emotional disorders.

## Emotional characteristics of ADHD

Children with ADHD may have emotional problems that are an integral component of their ADHD. Inefficient inhibitory processes in the brain are the basis of these emotional difficulties. This is analogous to the role of inhibitory failure in the causation of other aspects of the condition. The emotional problems are due to failure of inhibitory mechanisms to suppress certain thoughts and feelings, in the same way that the impulsivity is due to their failure to suppress instantaneous reactions, and the poor concentration is due to their failure to suppress extraneous stimuli.

Common emotional characteristics of ADHD are low frustration tolerance, preoccupations, thrill seeking, moodiness, and overexcitability.

### Low frustration tolerance

Children with ADHD often cannot control their feelings like other children of the same age. Their thoughts, and therefore their actions, are impacted upon by strong emotions to a far greater degree than those of their peers. This means that such children may have uncontrollable rages that are disproportionate to the triggering event. When these children feel under stress, or when their desires are thwarted, they become overwhelmed by anger and explode.

Such outpourings of rage are frightening to observers and, often, to the child herself. The outburst can continue for many hours with the child hurling abuse, making threats, and acting out her anger physically against objects and people. This physical aggression can be directed towards anyone or anything that the child comes across —even uninvolved bystanders. The child will even damage or destroy her own prized possessions in episodes known as *affective storms*.

The child may behave in this way in the company of strangers without showing any embarrassment. The feeling of rage often overwhelms the child to such a degree that she will be in tears during

the outburst. Many children run away or hide during or after such episodes.

Some children will be depressed and ashamed afterwards and apologize. Some will cover such feelings of shame with displays of bravado. Other children will not remember, or claim not to remember, anything that happened during an episode.

Such episodes are so severe that observers may question whether the child has had some form of seizure. While a particular form of epilepsy (*temporal lobe epilepsy*) can cause rage episodes, these occur out of the blue with no provocation. In the rages associated with ADHD, the trigger, however small, is always present.

## Preoccupations

Children with ADHD usually cannot filter out thoughts and emotions as easily as other children. Thoughts anchor in their minds and cannot be dislodged. The sensation is similar to that which occurs when one has been staring at a bright light and the image of the light remains imprinted on the retina after turning away. The child cannot erase thoughts or worries from her mind. She will find it hard to relax during the day and difficult to fall asleep at night because her mind is so active. For this reason, sleep-onset insomnia (sometimes known as *initial insomnia*) is common in children with ADHD.

For a similar reason, a child with ADHD will often nag interminably for something she wants. If there is something she is interested in, she may become obsessed with it and think of nothing else. She will accept no limits to her preoccupation and may want her parents to spend vast amounts of money on acquisitions connected with this passion. She will feel that they are being unreasonable if they refuse to do so.

Older children with ADHD who have access to their own money may squander large amounts on acquisitions related to their area of interest. Such insatiability and overfocusing are common features of ADHD.

It may seem strange that a condition that is characterized by poor concentration should be associated with *overfocusing*. However, this type of paradoxical overfocusing is a form of persistent *overdistraction*, in which the child's inability to shift her attention normally from one matter to another allows persistent distracting preoccupations to invade her thoughts constantly.

Eventually the overwhelming preoccupation ends abruptly and the child shows no further interest in what once consumed her. Frequently, after a short interval, a new preoccupation appears. This preoccupation must be distinguished from obsessive–compulsive disorder, which is described later. In obsessive–compulsive disorder, unlike the preoccupations seen as part of ADHD, the obsessions are more repetitive, ritualistic, and pointless.

## Thrill seeking

Children with the hyperactive–impulsive and combined types of ADHD often have faulty novelty and desire mechanisms in their brains that lead them to thrill-seeking behaviour, regardless of the danger. This is discussed further in Chapter 10.

For some children with ADHD, in order to enjoy an activity an element of danger may be necessary. Risk-taking behaviour is, therefore, more common in children with these types of ADHD.

This puts them at a greater risk of substance abuse. The most commonly abused substances are cigarettes, alcohol, and marijuana. One of the positive aspects of treating ADHD with medication is that research has shown that this substantially decreases the risk of later substance abuse (see Chapter 16).

## Dysthymia

Many children with ADHD have a constant feeling of dissatisfaction with life that is not severe enough to be regarded as depression. They seem to be 'down in the dumps' most of the time. Such children fail to derive pleasure from any activity or experience. They frequently complain that everything is 'boring' and that 'it sucks' and they hardly ever smile or laugh. They are often reluctant to embark on any new activity, claiming that they know they will not enjoy themselves. This state is known as *dysthymia*.

Children with dysthymia are often moody and irritable. They tend to be at their worst in the early morning when they are often groggy and uncooperative. It is characteristic of dysthymia that this mood persists for most of the day.

The possibility that this morning grogginess and moodiness is due to a sleep disorder should always be considered. Children with morning moodiness who also snore and breathe irregularly or noisily in their sleep may need special tests to detect whether they have obstruction to the back of the nose and the throat during sleep (*obstructive sleep*

*apnoea*). If present, this is usually caused by conditions such as enlarged adenoids and tonsils. Obstructive sleep apnoea leads to disturbed sleep, which may be the cause of the morning moodiness rather than the ADHD.

A child should also not be regarded as having dysthymia unless an assessment to rule out depression has been performed.

### Hyperexcitability

Dysthymia, because of its effect on mood, deprives some children with ADHD of enthusiasm for enjoyable experiences. However, some children with ADHD have the opposite problem—the tendency to become excessively excited and difficult to control when enjoying themselves. This is a manifestation of the impulsivity that is common in ADHD.

When children with hyperexcitability are enjoying themselves, they become so overwhelmed by their feelings that their behaviour becomes inappropriate and difficult to control. They lose the ability to behave in a responsible manner and often show off in an extreme way, take risks, become defiant and challenging, and even aggressive. The episode often ends in tears. Those who know the child may be surprised by how bizarre the child's behaviour can become in such a situation.

A typical situation in which this kind of behaviour is seen occurs when a friend comes to play. Sometimes parents are forced to stop certain treats because they end so disastrously for all concerned.

## Reactive emotions

As a result of their condition, children with ADHD must contend with many difficulties and disappointments. The impact that these have on their self-esteem may give rise to a number of emotional responses. These responses, and their related behaviours, comprise the second category of emotional disorders that occur in children with ADHD. They are described in detail in Chapter 7 and so are not discussed further in this chapter.

## Coexisting (comorbid) emotional disorders

Children with ADHD are more likely to suffer from certain specific emotional disorders than other children. This tendency for two

conditions to coexist is known as comorbidity. In this case, the comorbidity occurs because the two conditions, the ADHD and the emotional disorder, share common genes and so are commonly associated. This is described further in the Chapter 10.

A comorbid emotional disorder may develop at any time in a child's life, although this most commonly occurs at puberty. The deterioration in the child's condition may be incorrectly attributed to the hormonal changes of puberty, the child's increase in size outstripping her dose of medication, or to some other change in the child's life.

It is not uncommon for a child with ADHD to change at adolescence from having ADHD as her sole disorder, to having another condition, such as depression or obsessive–compulsive disorder, as her major or sole problem.

This sequence may lead to the erroneous belief that the original diagnosis of ADHD was incorrect—that the child suffered from the emotional disorder all along and that this had been mistaken for ADHD. However, this common sequence does not imply that the first diagnosis was incorrect.

A child with ADHD who has a comorbid emotional disorder may require special treatment for the disorder (counselling with or without medication). Therefore, it is important that those who care for children with ADHD should be alert to the possibility that a comorbid emotional disorder may develop.

Unfortunately, the occurrence of a comorbid disorder may mean that a child with ADHD needs to take more than one medication: one for the ADHD and another for the emotional disorder. Parents are often alarmed when their child's doctor suggests an additional medicine, but one medication is unlikely to help both ADHD and the associated emotional disorder.

Frequently, the comorbid disorder starts at a time that the ADHD is resolving, and it may then be possible to withdraw the medication used to treat the ADHD and replace it with one used to treat the comorbid emotional disorder.

## Specific comorbid emotional disorders

### Depression

Depression is significantly more common in children with ADHD. It is characterized by intense feelings of sadness and lack of pleasure in any activity.

A depressed child may become withdrawn and avoid contact with her family and friends. She may lack energy, and everything may be too much of an effort. She may spend large amounts of time sitting in front of the television or lying on her bed. She may eat and sleep poorly. She may appear dejected, as if about to burst into tears. She may experience feelings of worthlessness and guilt. She may be very negative about herself and highly sensitive to any perceived criticism by others. Depressed children usually cry easily.

Occasionally a child who is depressed becomes irritable rather than sad.

A child with depression may feel that her life is not worth living and some depressed children have suicidal thoughts and may even attempt suicide.

Some children with depression may engage in self-harm, such as cutting or burning their skin. Children who self-harm often hide the evidence of what they have done to themselves. If it is noticed, they frequently offer fabricated explanations for the damage.

Depression must always be treated with concern because of the risk of suicide. The child will benefit from counselling. Lifestyle changes also help, and it has been shown that children who exercise cope better with depression. A healthy diet, enough sleep, and social engagement are also important in improving mood. Medication for depression can be helpful if used in conjunction with counselling. Sometimes stimulant medication alone will be sufficient treat both ADHD and comorbid depression. In other children with ADHD and comorbid depression, an antidepression medication from the selective serotonin reuptake inhibitor (SSRI) class may be required.

**Anxiety disorder**

Anxiety disorder is approximately five times more common in children with ADHD. It is characterized by intense worry that cannot be controlled by the child. She may talk about her fearful feelings, or her anxiety may be expressed in bodily symptoms such as cold and clammy hands, a feeling of a lump in the throat, a racing heart, abdominal discomfort, and diarrhoea. The anxiety may be constant or episodic. Sometimes acute episodes of extreme anxiety are experienced (*panic attacks*).

The disorder may take the form of generalized anxiety disorder, in which worrisome thoughts are free-floating and attach themselves to one thing after another. A child with this disorder will be a worrier who is constantly concerned about what lies ahead.

Nothing seems straightforward to such a child: an imagined catastrophe is always about to happen. Such a child is often a perfectionist. She may redo her work because of her dissatisfaction with anything less than perfection. A child with anxiety disorder is generally very insecure and will constantly seek reassurance about her performance. Unfortunately, no amount of reassurance or positive experience dispels her fearfulness.

In some children, their anxiety is confined to certain specific situations. This kind of intense fear of a particular thing or situation is known as a phobia. Common phobias in children with anxiety disorder include *school phobia* (fear of attending school), *social phobia* (fear of being embarrassed in public), and *separation anxiety* (fear of being away from home).

Anxiety is best treated by counselling the child. With generalized anxiety the child can benefit from learning relaxation techniques and from cognitive therapy, where the child learns more positive ways of thinking (mind over body). Children with phobias may benefit from desensitization, in which the child is helped to cope with fearful situations in a gradual, stepwise process.

Tranquillizers do not have a place in the treatment of anxiety as they lose their potency with time, make children less alert, and can be habit-forming. However, there are medicines from the SSRI group that can be effective in anxiety if used in conjunction with counselling.

**Obsessive–compulsive disorder**

Obsessive–compulsive disorder is approximately five times more common in children with ADHD. It is characterized by the presence of time-consuming obsessions and/or compulsions.

Obsessions are persistent thoughts that are intrusive and inappropriate, and cause distress to a child. They are not within her control.

Compulsions are repetitive behaviours, such as hand washing or counting backwards, that the child carries out to reduce her feelings of distress. She feels driven to perform the compulsion to prevent some dreaded outcome. Compulsions may be simple or elaborate. The child will become very distressed if someone stops her from performing her compulsion.

Obsessive–compulsive disorder often responds to counselling that teaches the child to control her thoughts (*cognitive therapy*). Medicines from the SSRI class, which are also used to treat

depression and anxiety, are helpful in obsessive–compulsive disorder, but are best used in conjunction with counselling.

## Disruptive mood dysregulation disorder (DMDD)

Disruptive mood dysregulation disorder (DMDD) is characterized by irritability, anger, and temper outbursts. Such moods and behaviour are common in normal children, but in children with DMDD they are considerably more intense, frequent, persistent, and disabling. In a child with DMDD, irritable and angry moods are present most of the day, nearly every day, and severe temper outbursts (verbal or physical) occur on average three or more times a week. Furthermore, these outbursts are out of proportion with the situation and inconsistent with the child's developmental level. In addition, a child with this disorder will have trouble functioning due to irritability in more than one situation (e.g. at home, at school, and when with peers).

Children with extreme irritability are sometimes regarded as having 'childhood bipolar disorder' and treated as such. This is not appropriate: DMDD is not related to bipolar disorder. Surveys have shown that if a child with DMDD goes on to have an emotional disorder in adulthood, this is most likely to be anxiety and/or depression, rather than bipolar disorder.

Treatment of DMDD should be with behaviour-management therapy in the first instance. This is often successful. Sometimes medication is required as an adjunct to behaviour management. Stimulant medication is often effective in DMDD. In severe cases that are unresponsive to both behaviour management and stimulant medication, an SSRI medication and/or an atypical neuroleptic medication may be appropriate.

## Bipolar disorder

Bipolar disorder is more common in adolescents and adults with ADHD. It is rare in younger children. Bipolar disorder is characterized by the occurrence of one or more *manic episodes*. This term describes a change in mood lasting several days or more when the individual becomes abnormally euphoric.

A manic episode is not to be confused with a healthy feeling of happiness or exuberance. Rather, it is an alarming and excessive state of mind that will be recognized by those who know the individual as quite out of character. The adolescent will seem to be out of control, on an extraordinary 'high'—as if she has taken a drug

that has altered her mind and affected her judgment. She will have increased energy and hardly sleep, her speech will be rapid and voluble, and her thoughts will race in a chaotic way. She will display an inflated opinion of her own importance and show poor judgment, for example, telephoning the school principal at home and telling him or her how she thinks the school should be run. She may also become recklessly involved in unrestrained behaviours to satisfy her own pleasure, such as spending money (her own or her parents') on extravagant purchases or becoming sexually promiscuous.

Manic episodes are often associated with episodes of depression, and some individuals may move from one extreme to the other. The opinion of a child psychiatrist should be sought as a matter of urgency in the case of an adolescent who is experiencing a manic episode. There are now a number of mood-stabilizing medicines (including lithium, valproate, and carbamazepine) that can be used to control a manic episode and prevent recurrences.

SECTION 3

# The cause of ADHD

# 10

# An impairment in brain function

## Key points

- ADHD is usually due to a depletion of certain chemical messengers in the front part of the brain.
- The major cause of this depletion relates to a number of defective genes.
- ADHD shares some of its causative genes with certain other conditions, so having ADHD makes also having these other conditions more likely.

There is a tendency to blame 'bad parenting', or some 'attitudinal' problem on the part of the child when children have learning or behavioural difficulties. These ways of explaining children's difficulties arise from a number of traditions. First, people have for generations used terms such as 'naughty', 'lazy', and 'spoiled' without thinking carefully about the origins of children's behavioural and learning difficulties. Such phrases are handed down from parent to child as folk wisdom.

Second, the writings of Sigmund Freud, which have greatly influenced the thinking of many lay people and professionals, largely interpret children's behaviour in the light of their early experiences.

Third, many psychologists now practising were trained by behaviourists, who emphasized that all behaviour was learned. Behaviourism was based on research involving laboratory animals and the work of scientists such as Pavlov and Skinner.

The belief that behaviour is determined exclusively by external factors is no longer tenable. There is a great deal of evidence that children's brains are not 'blank slates' and that differences in brain development, structure, and function can give rise to behavioural and learning problems that are not a consequence of the environment.

Most important has been the realization that, to help many children with learning and behavioural difficulties, we need to treat an impairment in their brain function. It is now recognized that, for such children, treatment with counselling and behavioural training alone is often doomed to fail. The proof that ADHD is associated with an impairment in brain function, and not simply a matter of inappropriate child rearing or unrealistic expectations of children's learning and behaviour, comes from four areas of scientific research. This research has also provided our understanding of how ADHD comes about.

## Executive function deficits

In the 1970s the Canadian psychologist Virginia Douglas demonstrated that children with ADHD attained significantly lower scores on objective tests that measured attentional ability compared to normal children of the same age. Since then, a great deal of research has tested various cognitive abilities, such as working memory, sequencing, and impulse control, in children with ADHD and comparing their performance to that of normal children. These studies have consistently shown that there are significant measurable deficits in certain cognitive abilities in children with ADHD.

Children with ADHD have deficits in specific brain functions known as the *executive functions*. These are described in the section 'Executive functions' in this chapter.

## Frontal lobe underactivity

A type of brain scan, called a *positron emission tomography* (PET) scan, shows which part of the brain is active (i.e. utilizing glucose and oxygen) at any one time. When normal individuals carry out executive functions, the frontal lobes become highly active.

The earliest PET studies carried out in people with ADHD were those by Hans Lou in Denmark (children) and Alan Zemetkin in the USA (adults). These studies demonstrated that the frontal region of these individuals' brains (particularly the part known as the *striatal area*) was less active than those of normal subjects when they were carrying out executive functions.

The part of the brain involved in ADHD is discussed in the section 'The frontal lobes of the brain' in this chapter.

## Neurotransmitter depletion

Hans Lou showed that the abnormalities on the PET scans of children with ADHD were corrected when a medicine, methylphenidate (Ritalin), was given. Ritalin increases the levels of a chemical messenger (neurotransmitter) called dopamine, which is produced at the ends of nerve cells in certain parts of the brain.

Measurements have shown that there is significantly more dopamine transporter activity in the frontal area of the brains of many individuals with ADHD, compared with that in normal individuals. This indicates that in many individuals with ADHD, dopamine is being recycled by this increased dopamine transporter activity before the dopamine has had a chance to do its work as a chemical messenger. This and other neurotransmitter abnormalities in ADHD are discussed in the section 'Neurotransmitters' in this chapter.

## Gene defects

There is a great deal of evidence that genetic factors are important in the causation of ADHD. First, there is an increased frequency of ADHD in the relatives of individuals with the disorder. Second, studies of adopted children of parents with ADHD have demonstrated an increased frequency of ADHD in these children despite their being raised away from their biological parents. Third, there are several large studies of identical and non-identical twins that demonstrate that genetic factors are paramount. This information is obtained by comparing a measure known as the *concordance rate*.

Concordance means that both of a pair of twins is the same with respect to the condition studied (i.e. if one has ADHD, the other twin also has it, or if one does not have it, the other twin also does not have it). If concordance rates for identical and non-identical twins are no different, then a condition is caused only by factors in the child's environment, such as the way the child was raised.

In ADHD, the concordance rate for identical twins is extremely high, while for non-identical twins it is the same as for non-twin siblings. This demonstrates that the genetic component in the causation of ADHD is extremely high.

The figures obtained from concordance rate studies can be used to calculate the exact contribution made by genes to the causation of a disorder. This is known as the hereditability factor, and in ADHD this is approximately 95%. ADHD is, therefore, primarily a genetic disorder—the child's environment plays only a very small part in its causation.

Genetic studies have led to the identification of several defective genes associated with ADHD. All these genes influence the amount of the neurotransmitters dopamine and norepinephrine (also known as noradrenaline) available in nerves connected to the frontal lobes. Genes that cause ADHD are discussed further in the section 'ADHD genes' in this chapter.

## Overview of causation

The four findings described earlier—executive function deficits, frontal lobe underactivity, neurotransmitter depletion, and genetic defects—allow the causation of ADHD to be traced from the basic problems with learning and behaviour back to the genetic defects from which the condition originates.

The causation of ADHD is described in the four sections that follow. The first section, 'Executive functions', outlines the basic nature of the impairment in brain processing in ADHD. The second section, 'The frontal lobes of the brain', describes the part of the brain impaired in ADHD. The third section, 'Neurotransmitters', describes the brain chemicals involved in ADHD. The fourth section, 'ADHD genes', deals with the genetic defects in ADHD.

### Executive functions

The human brain is an organ of breath-taking complexity—it is the most sophisticated device in the known universe. Its information processing power dwarfs even that of the most powerful supercomputers. The brain must deal appropriately with a steady stream of information from the outside world, as well as the flow of thoughts and feelings that originate within the mind and body. A huge range of responses is available to the brain, from the simplest twitch of a muscle to complex tasks like speaking and writing.

Like a large business organization, the brain carries out its tasks in a hierarchical system. Lower-order functions (such as talking, moving, seeing, and hearing) are carried out by the equivalent of the workers in the organization. Higher-order functions (such as self-organization, self-regulation, and self-appraisal) are carried out by the equivalent of the chief executive officer of the organization and are known as *executive functions*.

Table 10.1 lists the executive functions of the brain, such as concentration, reflection (stopping to think so as not to act impulsively), and social cognition (interpreting social situations in order

to act appropriately). They enable an individual to think ahead, defer gratification, and modulate mood. They play a vital role in controlling the individual's performance.

**Table 10.1** Executive functions of the brain with the corresponding features of ADHD

| Executive function | Feature of ADHD |
|---|---|
| Sustained attention | Poor concentration |
| Reflection | Impulsivity |
| Temporary immobilization | Overactivity |
| Self-organization | Lack of planning |
| Self-regulation | Inflexibility, low frustration tolerance |
| Self-appraisal | Poor self-esteem |
| Social cognition | Social clumsiness |
| Compliance | Defiant behaviour |
| Working memory | Forgetfulness, poor planning |
| Coordination of movement | Clumsiness |

It is impairment of these executive functions that gives rise to the features of ADHD described in Chapter 1. In Table 10.1, each executive function is matched up to a corresponding feature of ADHD.

It is evident that ADHD is not a problem of ability (the 'workers' in the organization are not directly affected), but of performance consistency —the problems one would expect if an organization lacked effective leadership.

When the executive functions of the brain fail, the individual responds to the world in an unfocused, disorganized, impulsive, and chaotic way. These are the characteristics of the behaviour and learning of children with ADHD. In normal individuals, the executive functions have two important characteristics:

1. They are *intrinsic*, i.e. they are not taught but develop spontaneously.
2. They are *maturational*, i.e. they become more refined and reliable with age.

These characteristics are important in understanding the difficulties experienced by children with ADHD.

## The frontal lobes of the brain

The functioning of the human brain differs from the brains of other animals in the highly developed nature of its executive functions. Not surprisingly, the part of the brain where these functions are controlled forms a much larger proportion of the human brain than it does in the brains of other animals (e.g. 30% of the human brain, but only 3% of the cat's brain). This part of the brain, the frontal lobes, lies behind the forehead and is, from an evolutionary point of view, the most recently developed.

The frontal lobes form the 'command post' of the brain and are often likened to the conductor of an orchestra. Other parts of the brain are analogous to the instrumentalists, each with his or her own part to play —but it is the conductor who ensures that they play together in an integrated, purposeful, and balanced way.

The frontal lobes are situated at a pivotal position in the brain and communicate with every functional unit of the brain via a rich network of nerve pathways. No other part of the brain is so well connected. These lines of communication allow the frontal lobes to contain within them a 'map' of the rest of the brain. This is where the individual's inner perception—his consciousness of his mental world—resides.

A commander is only as good as his or her lines of communication, and if the pathways connecting the frontal lobe to other parts of the brain are not able to function adequately, the ultimate outcome is no different to what would happen if the frontal lobes themselves were malfunctioning. In most individuals with ADHD, it is the connecting pathways to and from the frontal lobes that function inadequately.

The commonest pathway to be affected is the *fronto-striatal connection*. This links the frontal lobes to an area known as the *striatum*, which forms part of a group of structures at the base of the brain known as the *basal ganglia*. The striatum is so called because of its striped appearance. It consists of two separate structures that lie side by side: an elongated *caudate nucleus* and a rounded *putamen*. In humans and in other mammals, the striatum works in such close collaboration with the frontal lobes that the frontal lobes and striatum together are referred to as the greater frontal lobes. Figure 10.1 shows the fronto-striatal connection.

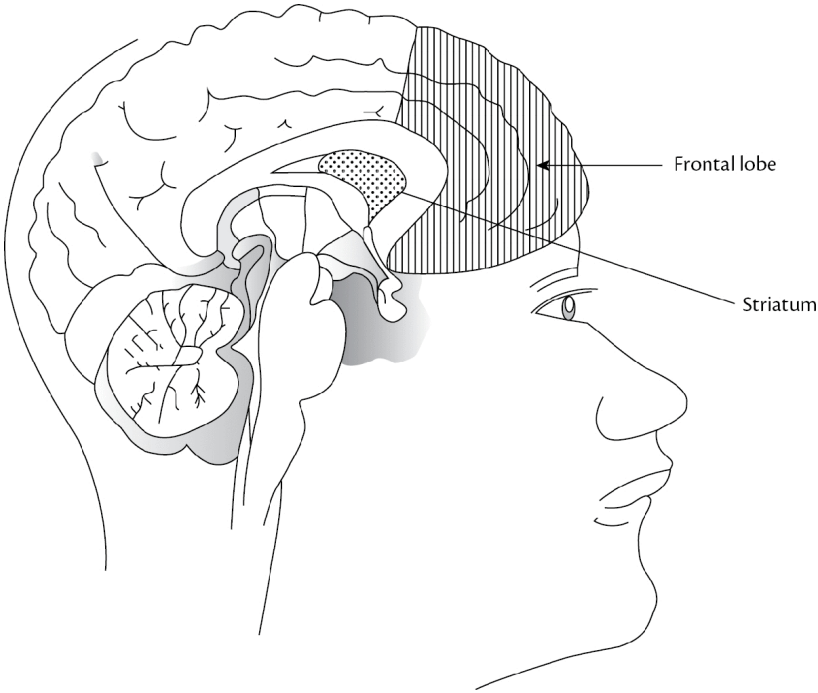


**Fig. 10.1** The frontal lobe and the location of the striatum.

A characteristic of the nerves forming the fronto-striatal connection is that they all produce the same family of chemical messengers to transmit impulses from one nerve cell to the next along the connection. This family of chemical messenger is known as the *monoamines*. The specific monoamines involved in the nerves of this connection are dopamine and norepinephrine. Both of these monoamine neurotransmitters are involved in the causation of ADHD. A third monoamine neurotransmitter, *serotonin*, also plays a role in ADHD, but its role is less significant and so it is not discussed in this book.

## Neurotransmitters

The brain is composed of a network of approximately 100 billion nerve cells. Each one of these nerve cells is linked to more than 1,000 other nerve cells. Messages flow along nerves in a way that is comparable to low-voltage electricity travelling through wires.

The nerve cells end in long projections known as *axons*. The electrical impulse comes to a stop at the end of the axon. The end of the axon does not touch the next nerve cell; it is separated from it by a small gap, the *synapse*. For the impulse to be transmitted to the next nerve it must traverse the synapse between adjoining nerve cells. A chemical messenger, the neurotransmitter, achieves this.

The neurotransmitter is released by the tip of the axon of the first nerve cell and crosses the synapse and attaches itself to a receptor on the next nerve cell. This stimulates the second cell to start an electrical impulse of its own. Figure 10.2 shows the end of a nerve cell (the axon tip) and the neurotransmitter it produces to transmit its message to the next nerve cell.

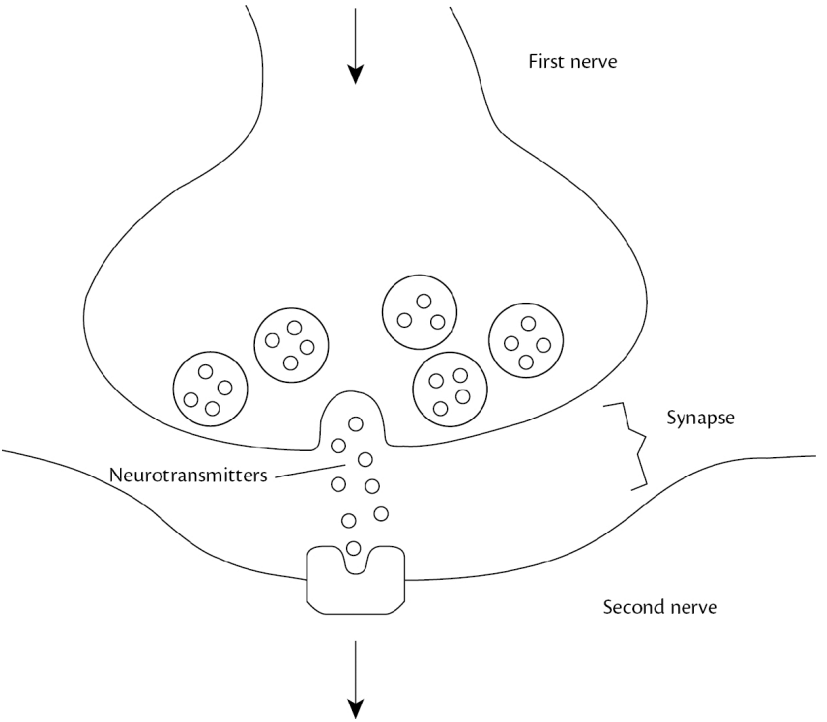


**Fig. 10.2** The synapse between two nerve cells.

The production of the monoamine neurotransmitters dopamine and norepinephrine consists of several steps. The neurotransmitter must be manufactured in the cell from its basic components (synthesis). It must then be stored in small containers in the cell, called the *storage*

*vesicles*. When an electrical impulse reaches the end of the nerve cell, the neurotransmitter must be released from the nerve end. The neurotransmitter then exerts its action by attaching (binding) itself to a receptor on the next cell, causing it to fire (send a signal in turn).

Other factors also come into play. The amount of neurotransmitter present in the synapse will depend not only on the amount released by the nerve ending, but also on how quickly it is broken down, and thus inactivated, by enzymes present in the synapse.

There is a recycling process with the nerve cell that manufactured the neurotransmitter, reabsorbing some of it so that it can be reused (*reuptake*). In the case of dopamine, it is the *dopamine transporter* (DAT) that is responsible for this reabsorption.

There are also some feedback mechanisms that enable the cell to gauge whether there is sufficient neurotransmitter in the synapse or not. This is determined by autoreceptors on the nerve ending that produce the neurotransmitter. Any excess neurotransmitter in the synapse binds to the autoreceptors. If the autoreceptors are vacant, more neurotransmitter is released.

The receptor on which the neurotransmitter acts (by binding to it) must be responsive to it for transmission to occur. In the case of dopamine, there are five different types of receptor in normal individuals. Although dopamine itself can bind to any of these five types of receptor, medicines that affect dopamine receptors often work only on certain types of dopamine receptor and not on others. This makes the actions of many medicines specific to certain dopamine disorders.

This complex process of neurotransmitter production, release, reuptake, feedback control, and receptor binding is referred to as the *metabolism of the neurotransmitter at the synapse*. The basic defect in ADHD is faulty metabolism of dopamine and/or norepinephrine at the synapse that leads to poor transmission of nerve impulses from one nerve to the next. Any stage in the metabolism of these neurotransmitters may be involved. For ADHD to occur, more than one stage is usually impaired, as explained in the next section.

The defects in ADHD are usually located in the nerve cells of the fronto-striatal connection. There is, therefore, effectively blockage to nerve transmission in this part of the brain. When a message is required for adequate processing of an executive function, such as controlling impulsivity, concentrating, or working with short-term memory, the message is not able to travel from one nerve cell to another. In most individuals with ADHD, this comes about because of the presence of defective genes.

## ADHD genes

All chemical processes in body cells are under the control of the genes. The metabolism of dopamine and norepinephrine neurotransmitters at the synapse is no exception. A separate gene controls each step in dopamine and norepinephrine metabolism at the synapse. There are literally hundreds of dopamine genes and norepinephrine genes. Some aspects of metabolism are common to dopamine and norepinephrine, and so some genes affect both neurotransmitters.

A number of defective variants of dopamine and norepinephrine genes have been found to be associated with ADHD in studies carried out since the early 1990s. These variants are sometimes referred to as *ADHD genes*. Small numbers of these ADHD genes are not usually sufficient to cause significant disruption to dopamine or norepinephrine metabolism and to cause ADHD. This is because there are so many compensatory mechanisms in the metabolic pathways of these neurotransmitters at the synapse. For example, a reduction in dopamine release from the storage vesicles would be detected by the auto-receptor feedback mechanism, and dopamine levels would be maintained by an increase in dopamine synthesis and a reduction in dopamine reuptake.

The presence of a small number of defective dopamine and norepinephrine genes is common in normal humans. It has been suggested that this may have come about because a degree of restlessness and impulsivity would have been advantageous during early human evolution. Individuals with these traits would have been more likely than their less adventurous companions to find new hunting and feeding grounds and to come across new sexual partners. This would have led to their having more offspring, many of whom would have received the defective neurotransmitter genes of their parents.

ADHD occurs only when multiple disruptions to dopamine and/or norepinephrine metabolism at the synapse by several ADHD genes overwhelms the compensatory mechanisms. It is the additive effect of these different genes that causes ADHD to occur. This is true whether all the defective genes present are dopamine genes, norepinephrine genes, or (as is often the case) genes defective for both neurotransmitters.

This additive effect leads to a significant disruption of nerve transmission that cannot be compensated for by other steps in neurotransmitter metabolism. ADHD is, therefore, not a simple genetic

disorder, caused by a single gene, but a complex *polygenetic disorder* (poly comes from the Greek word for many).

### Patterns of inheritance

If parents have had a child with ADHD, the chance of each successive child having ADHD is five to six times greater than for the general population, i.e. the risk increases to one in three.

ADHD is a polygenic disorder requiring several genes acting in combination. This makes the pattern of inheritance of the condition complex and variable. Often one of the parents of a child with ADHD also has the condition. In this situation, the affected parent's genes are transmitted to the child and the inheritance is easy to understand.

The situation is more puzzling to parents when there is no history of ADHD in the family. In such a situation, it is probable that both parents carry a small number of ADHD genes that are insufficient to cause ADHD in them. It should be remembered that ADHD genes are common in the general population. When the genes from both parents combine in their child, they may have an additive effect that is sufficient to cause the condition in the child.

Sometimes the presence of ADHD in a sibling of one or both parents indicates the presence of ADHD genes in the family.

One of the results of so many different genes being involved in the causation of ADHD is that the condition does not always 'breed true' in a family. This means that ADHD may occur in different forms in different members of the same family. This is because the exact combination of ADHD genes that each affected sibling received from his or her parents may not be identical. In the same way, not all affected siblings in a family are necessarily helped by the same medicine.

### Why comorbidity occurs

Conditions that commonly coexist with ADHD, the comorbid disorders, are described in earlier chapters. These include tic disorder, dyslexia, oppositional defiant disorder, conduct disorder, autism spectrum disorder, depression, anxiety disorder, obsessive–compulsive disorder, disruptive mood dysregulation disorder, and bipolar disorder.

The comorbid disorders that may coexist with ADHD are also polygenetic in their causation. Comorbidity occurs because ADHD and its associated conditions share some genes in common. Each comorbid condition is caused by some ADHD genes, together with additional genes unique to it. This is demonstrated for tic disorder in Figure 10.3.

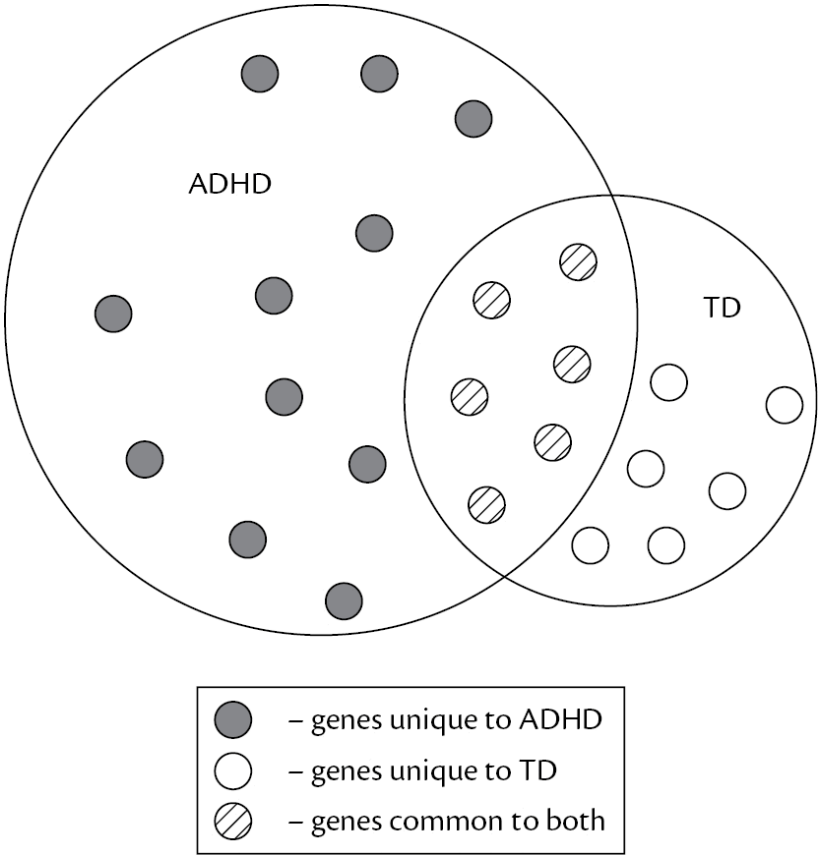


**Fig. 10.3** Comorbidity and genes. ADHD and tic disorder (TD) share some of their genes.

Among the genes that cause ADHD are some that are involved in the causation of tics. A person with ADHD, therefore, needs only a few additional tic genes to suffer tics as well as ADHD. As tic genes are common in the community, individuals with ADHD will often inherit the additional genes, so that they have both ADHD and tics (comorbidity). The same applies to all the other comorbid conditions.

This explains some observed interrelationships between different conditions that puzzled doctors in the past. For example, it was commonly observed that parents with bipolar disorder were more likely to have a child with ADHD and that such children were more likely to develop bipolar disorder later. An explanation for this sequence of

events is now possible. Some bipolar genes are also ADHD genes. These ADHD genes from the parents combine in the child and so are sufficient to cause ADHD. The ADHD in the child resolves at adolescence, which is when the bipolar disorder genes begin to express themselves for the first time.

This also explains why some of the characteristic features of ADHD are in fact milder forms of certain comorbid emotional disorders. It may, for example, be the genes common to ADHD and depression that cause the dysthymia (low mood) that is often part of ADHD; similarly, some of the obsessive–compulsive disorder genes that are common to ADHD may cause the preoccupations that often form part of ADHD. In this way the continuum of features can be explained: extending from a 'restless mind' to anxiety; from dysthymia to depression; from social clumsiness to autism spectrum disorder; from irritability to disruptive mood dysregulation disorder; and from preoccupations to obsessive–compulsive disorder. The severity of each will depend on the number of genes the person has inherited for that particular emotional disorder.

## Non-genetic factors

While ADHD is caused by genetic factors in the majority of cases, non-genetic conditions can play a causative role in some children with ADHD. They may be the primary cause or a contributing factor.

Any condition that causes sufficient damage to the frontal lobes can cause ADHD. Such conditions include severe head trauma, brain haemorrhage (which is more common in premature babies), lead poisoning (if it occurs before the age of three years), brain infection (meningitis or encephalitis), brain tumours, leukaemia (particularly if treated with head radiotherapy), hydrocephalus, and neurofibromatosis.[1]

Some non-genetic causative factors will give rise to ADHD only in an individual who has a genetic susceptibility. In this situation, the child has a small number of ADHD genes that are insufficient to cause ADHD on their own. The non-genetic condition acts as a contributing factor rather than as the primary cause of the ADHD. Such contributing factors include low birth weight, smoking during pregnancy, and alcohol abuse during pregnancy. In addition, any of the non-genetic causes listed in the previous paragraph could, if mild, act as a contributing factor rather than the primary cause.

The paediatrician who makes the diagnosis of ADHD in a child will be in the best position to assess whether any of these non-genetic factors

played a role in causation.

---

[1] Neurofibromatosis is a genetic disorder; it is included with non-genetic disorders because the neurofibromatosis gene is not one of the ADHD genes.

SECTION 4

# How ADHD is diagnosed

# 11

# Diagnosis and assessment

## Key points

- The first step in the treatment of ADHD is making the correct diagnosis.
- The diagnostic process involves history taking, examination, completing questionnaires, psychometric testing, and other special testing if required.

The first step in the treatment of ADHD is making the correct diagnosis. Only when it is confirmed that a child has ADHD and that all other possible causes of child's problems are excluded, can a proper treatment programme be devised.

The best person to make the diagnosis is a specialist paediatrician with an interest and expertise in developmental and learning difficulties in children. These developmental paediatricians work in close liaison with educational psychologists, who play a vital role in the process by which ADHD is diagnosed.

Diagnosis involves several steps. First, a careful history must be taken to collect information about how the child learns and behaves at home and at school. Often this will require that parents and the teachers fill out a standard questionnaire that has been designed to help make the diagnosis of ADHD.

Second, the paediatrician will carefully examine the child to ensure that there is no other condition interfering with his learning and/or behaviour. He or she will then arrange any further special investigations, if necessary.

Third, special (psychometric) tests will need to be performed to develop an understanding of the child's particular areas of difficulty.

It is then the responsibility of the paediatrician to evaluate all this information and to make a diagnosis, which he or she should explain to the parents.

## The history

The paediatrician will ask questions to ascertain the child's special problems. He or she will want to know how long the parents have been worried about the child, what concerns them, and which treatments have already been tried.

He or she will want to look at school reports to find out how the child is progressing and how teachers have evaluated the child over the years. In some cases, the teacher could be given a special checklist designed for children with ADHD in which he or she can tick off those symptoms that have been noted in the classroom. Sometimes it is best if the teacher, with the parents' permission, rings the doctor to give a first-hand description of the child's behaviour.

It is a good idea to obtain reports from other professionals who have seen the child in the past, and to show these to the paediatrician.

The paediatrician will also ask the parents about how their child behaves at home. It is best if both parents attend the assessment so both can give their views about the child. This will also allow both parents to hear the results and recommendations, and to have a say in any treatment plan that is developed.

The paediatrician will ask about the pregnancy and birth, as well as about any health problems that the child has had. He or she will also want to know about the health and development of members of the child's family.

He or she will want to ensure that the child has adequate vision and hearing. This will usually require referral to an ophthalmologist (a doctor specializing in eye disorders) and an audiologist (a technician trained to test hearing).

The paediatrician may also give parents a questionnaire to complete to obtain more detailed information about the child's behaviour. These questionnaires are used as a guide and have been administered to many thousands of parents to obtain an idea of what constitutes normal behaviour.

## The examination

It is essential that the paediatrician carefully examines the child to ensure that the child does not have a condition other than ADHD that interferes with learning. He or she will check the child's growth (height, weight, and head size). He or she will search for any unusual

features in the child's body that suggest one of the rare genetic syndromes that are associated with learning difficulties.

There are a number of conditions that the paediatrician needs to exclude before he or she can make a diagnosis of ADHD. They must confirm that the child does not have a vision or hearing impairment that is causing the problem. Intellectual disability must be excluded. Physical disability, such as cerebral palsy, must also be excluded. Such conditions may be present but may not explain all the child's difficulties; i.e., they may act as an aggravating factor in a child whose primary problem is ADHD. For example, a child may have mild intellectual disability, but may have problems with concentration and impulsivity that are excessive for her degree of intellectual disability. Such a child may have ADHD, as well as intellectual disability, and may benefit from treatment of the ADHD.

## Psychometric testing

Careful evaluation of a child's particular areas of strength and weakness is essential to make the correct diagnosis, as well as to plan appropriate strategies for helping the child. It is only by this sort of evaluation that certain conditions that mimic ADHD, such as intellectual disability, can be excluded.

Only once the child's particular areas of strength and weakness are established can an individualized treatment programme be planned. For example, a child with ADHD who has reading problems will need a different sort of help from the child with ADHD who is a proficient reader.

The evaluation of a child's particular areas of strength and weakness requires individualized testing by an experienced educational psychologist using a battery of standardized *psychometric* tests. The tests that are generally used have been administered to many hundreds of children to obtain standards for different ages. They have been carefully devised to compare an individual child's skills to those of her contemporaries. In this way one can determine whether a child is advanced, delayed, or age-appropriate in different areas of development.

Tasks are presented in a specific order with the easier ones first. They then become progressively more advanced to establish at what level they become too difficult for the child. Every child who does the test will be presented with tasks that are easy, as well as tasks that

are too difficult for her. This is necessary to find out the exact level at which she is functioning.

During the test, a picture of the child's developmental progress can be formed, both for specific areas of development and for development as a whole. Sometimes a great deal of information can be gained from the way in which the child tackles tasks, even if she is unable to succeed. For example, the psychologist will observe her ability to persist with tasks, to attend for long periods, and to sit still.

The psychologist will choose tests that are most useful for that child. There are now many tests available and the psychologist will usually select a number of these. Children with suspected ADHD should be given a test of intelligence, tests of academic achievement, and certain other tests of special ability.

## Tests of intelligence

Although intelligence tests have come in for criticism over the past few years, they still form an essential part of establishing a child's abilities and needs. They must be performed by an experienced educational psychologist and interpreted with care. The results of the tests should be regarded as only part of the child's assessment and need to be interpreted in the light of reports of her abilities at other times as well as the results of any previous tests.

Intelligence tests assess general intelligence. Many are well suited to children with learning difficulties because they do not involve reading or writing. They can, therefore, test intelligence irrespective of academic achievement. Intelligence tests not only establish the child's level of general intelligence, but also give valuable information about individual components of intelligence, such as short-term memory and sequential processing.

The different tasks in the most widely used intelligence tests are usually grouped into various sub-tests; the score of each sub-test reflects a particular area of intelligence.

The sub-tests for one of the most common intelligence tests for school-aged children are grouped together to give a *Verbal Comprehension* score, which is a measure of the child's ability in language-related tasks, a *Visual Spatial* score, which is related to visual and manual tasks, a *Fluid Reasoning* score, which uses visual tasks to determine the child's ability to detect underlying conceptual relationships, a *Working Memory* score, and a *Processing Speed* score.

In interpreting these various components of intelligence tests, it is important to keep in mind the child's overall level of skill. For example, a highly intelligent child who is functioning in the superior range overall may be regarded as having specific difficulties if her working memory score is only in the average range. On the other hand, such a score in working memory would be considered acceptable in a child whose overall intellectual function was also in the average range.

## Tests of academic achievement

These include tests of reading, spelling, writing, and mathematics. It is essential that all children with ADHD have these tests, in addition to an intelligence test. It is not uncommon for a child who is thought to be functioning adequately at school to be found to have an unrecognized difficulty in one or more aspects of academic competence.

Academic achievement tests establish the level of a child's skills in a particular area of learning compared to her peers, and give important information about the nature of a child's difficulties in the area tested.

Reading tests measure reading speed (rate), reading accuracy, and reading comprehension. Reading speed and accuracy are combined to score reading fluency. Spelling is tested by asking the child to spell words from dictation. Mathematics is tested by asking the child to solve a series of graded arithmetical problems. To test writing, three samples of writing are usually obtained: a passage of free composition on a particular topic, a piece of dictation, and a copy of some printed material. In addition to the writing test, the psychologist may administer other tests, such as tests of drawing and visual perception.

The results will be given in terms of an age equivalency, i.e. the age at which the average child is able to function in the same way as the child who was tested. Some test results are expressed in *percentiles*, which indicate the percentage of children who would function less well at the same age. For example, a child with spelling competence on the 40th percentile would be functioning better than 39% of children of the same age.

These tests compare children to others of the same age. Allowance may be necessary for children who started school at a later age than usual. Having been at school for a shorter length of time than most children of their age, it should be anticipated that their academic

attainments may reflect this, rather than any lack of potential on the child's part.

### Tests of other special abilities

Children with suspected ADHD should have careful assessment of their auditory and visual attention span, using standardized tests for skills such as vigilance (ability to allocate attention to a new stimulus), task persistence, distractibility, and short-term (working) memory.

These tests may be computerized. For example, in one commonly used test of vigilance, the child must push a button whenever a particular number sequence (the stimulus) appears on the computer screen. The computer analyses the child's performance and compares it to standards for her age.

Such tests play an important part in helping the developmental paediatrician to make the diagnosis of ADHD. They cannot be used in isolation but form part of the information that is required to determine whether the child has ADHD or not. They may also play an important role in determining the child's response to treatment and in reviewing the child's progress over time.

Children with difficulties with handwriting or with other fine motor skills, such as drawing, using scissors, or tying knots, should have standardized tests performed by an occupational therapist.

Children with gross motor difficulty, in such activities as walking, running, jumping, hopping, or bicycle riding, may need to be referred by the developmental paediatrician to a physiotherapist for standardized testing.

Children with ADHD often have difficulties with language. These may affect receptive language (understanding), expressive language (the ability to put words together), or speech (the clarity of the spoken word). A child with suspected language difficulties should be assessed by a speech therapist (sometimes called a speech pathologist). Such an assessment involves both informal observation and standardized tests to evaluate speech, expressive language, and receptive language. In addition to establishing the child's level of development in these areas, the speech therapist will determine the specific nature of her difficulties. No such testing should be performed until the child's hearing has been properly tested.

## Special investigations

If the paediatrician considers it necessary, he or she will arrange special investigations to determine the cause of the child's difficulties. These investigations include blood tests and brain scans. Such testing is not done routinely.

If a child who has poor concentration seems to have 'blank' episodes, the paediatrician may arrange for a special brainwave test called an EEG (electroencephalogram) to determine if the child has a type of epilepsy that causes very short 'blank spells'. Occasionally this condition may be mistaken for the inattentive type of ADHD. A special cap is placed on the child's head. The cap has wires that are connected to a computer. The computer measures the child's brainwaves and displays them on a screen and prints them on paper.

An ordinary EEG cannot determine if a child has ADHD; however, there are some special tests of brain electricity that have been used to obtain objective measures of brain activity that are useful in diagnosing ADHD. For such testing, a more sophisticated analysis of brain electricity is performed. As in the case of an ordinary EEG test, an injection is not required, radiation is not involved, and there is no discomfort to the child. It is completely safe. The analysis of the brainwaves is performed while the child carries out three tasks: concentrating on a special pattern produced on a screen, counting intermittent tones produced through headphones, and sitting still with their eyes closed. The results of this testing give rise to a scan of the brain known as a quantitative EEG (QEEG) and a composite of brainwave patterns known as a cognitive event-related potential (CERP). These should be interpreted only by those with expertise in this field.

## Formulation of a management plan

Once the developmental paediatrician has compiled information about the child, a treatment plan is developed. The paediatrician will provide a thorough explanation of the findings shortly after the examination. He or she will also make recommendations about ways of helping the child.

Parents should remember that these are only suggestions; they know their child and family best and will need to decide whether they feel that the recommendations are right for their child and their family. If they feel unhappy with any of the suggestions, they should not hesitate to tell the paediatrician; the parents can then work with the paediatrician to form alternative strategies.

Each treatment plan will be tailored to the child's particular areas of difficulty. There is no single approach that suits all children. Children with difficulties in a particular academic area may need remedial help, while others who are proficient in the area will not.

Medication should be considered for all children with significant difficulties, but this decision, too, needs to be individualized.

## Review assessments

If a child's problems resolve, reassessment will not be needed; however, if the child continues to have difficulties, further assessments are necessary to monitor the child's progress and ensure that any special needs are met.

Reviews usually occur every six months and involve a physical examination, psychometric testing, and any other special testing to determine how the child is progressing. A report from the child's teacher should be requested for all reviews.

SECTION 5

# Multimodal treatment

# 12

# Home management

## Key points

- No plan of management can ever be successful if it is not based on a comprehensive assessment of the child's particular strengths and difficulties.
- Look upon the child with ADHD as someone whose behaviour and learning inadequacies are due to a hidden disability that are not of his, or his parents', making.
- Before looking at ways of helping your child, it is essential to look at your own needs and concerns.

Children with ADHD are very challenging to bring up. No parent of a child with ADHD will be able to respond in a textbook manner to every difficulty that arises. Children with ADHD often bring out the worst in their parents, and even the most patient and understanding parent is likely to make many mistakes.

All that a parent of a child with ADHD should hope to achieve is to be a 'good enough' parent—a parent who tries to do his or her best, who learns from his or her mistakes, and who provides support for the child through all the difficulties that life presents.

## Understanding—the first step in management

No plan of management can ever be successful if it is not based on a comprehensive assessment of the child's particular strengths and difficulties, as described in Chapter 11, and a careful explanation to both the parents, and the child, of the nature of the condition.

Unfortunately, there is a great tendency to blame any behavioural or learning difficulty on inadequacy on the part of the parents or an intentional failure on the part of the child. This belief is deeply rooted in the way in which we interpret children's behaviour. Understanding

ADHD requires a shift in our way of thinking about and perceiving children's actions.

We are almost unable to think of the brain as an organ, just like the lungs or the heart, and to realize that its primary function is to control behaviour and learning. All behaviour is controlled by the brain.

One often hears comments such as 'His poor concentration is not due to ADHD, it is behavioural!' However, to say that a behaviour is or is not 'behavioural' is meaningless. A behaviour must be 'behavioural'—that is what that adjective means! What the person probably means by the word 'behavioural' is that the behaviour is in some way due to inadequate child-rearing, or some vague notion of 'naughtiness' on the part of the child. That the word 'behavioural' has become almost synonymous with such causation tells us a great deal about how lopsided our view has become about the causes of children's behaviour.

There is no doubt that a child can behave in an unwanted way because of poor child-rearing experiences, but this is not the only, or necessarily the most common, cause of behavioural difficulties.

All unwanted behaviours in children should be looked at objectively to determine causation. Some will be due to an inadequacy in the way in which the child has been reared, many will be due to an inefficiency in the child's brain, and some will be due to a mixture of the two. In other cases, the cause may best be viewed as a mismatch between the child's brain and the environmental demands that are placed on him.

It is interesting that when children have difficulty walking, we point to their legs as the likely cause of the problem; if they have difficulty breathing, we point to their lungs; when they have difficulty hearing, we point to their ears—but when they have difficulty behaving, we point to their parents!

Only a careful assessment can tease out the factors that relate to child-rearing and those that relate to immaturities in the child's brain. Then a proper understanding and management plan can be devised.

Once it is determined that the child's difficulties are due to ADHD, we must look upon the child as someone whose behaviour and learning inadequacies are due to a hidden disability that is not of his, or his parents', making. Once this is understood, the child can be helped.

## Explaining to the child

Parents are sometimes concerned about telling their child that he has ADHD in case he becomes upset about knowing that there is an inefficiency in his brain. However, children with ADHD know from an early age that there is something different about them. They know that they are getting into more trouble than other children or that they are struggling to learn things that other children are learning with ease.

Children start to compare themselves with their peers from an early age and are quick to notice which things they find difficult. Unfortunately, if parents or professionals do not explain to the child with ADHD the cause of his problems, the child is likely to conclude that he is 'dumb' or 'stupid'. Children with ADHD tend to find a locus of blame for things that go wrong in their lives (see Chapter 7), and therefore can easily become angry and depressed by their difficulties.

It is, therefore, a good idea to tell your child about ADHD at an early stage. Do not wait until he becomes confused and discouraged. Explain that different people are talented in different ways. Point out those things at which he is better, and the special qualities he has. Tell him about the things that you find difficult. Then explain that some things are difficult for him to do, even when he tries very hard. Explain that this is simply because a part of his brain is taking a little longer to switch itself on completely.

Explain that, as children grow, changes occur in their bodies. They get new teeth, they grow taller, they become stronger, their bodies change into those of adults, and so on. Explain that there is a little mechanism in the brain that is important for helping a person to concentrate and control frustration and that this becomes stronger as children grow older. Describe it as being like a switch that is slowly turned on.

Just as some children get their teeth a little later, or go into puberty a little later, so in children with ADHD this 'switch' takes longer to turn on completely. Emphasize that the switch is already partly on and that the child can already concentrate and control his behaviour, but that it is more difficult for him to do these things. You may need to explain that that is why he sometimes finds it difficult to sustain his attention, control his impulsivity, or manage to win friends.

It is important that children with ADHD realize that they *can* do the things they find difficult, and that they are *not* led to believe that these things are impossible for them to achieve. However, it is essential to acknowledge the great difficulty that they experience in trying to be consistent in performing certain tasks.

It is also important to distinguish between disability and laziness. A child with ADHD should not be able to use his disability as an excuse for quitting when a goal is attainable.

There are now many good books that are written for children with ADHD to explain their condition to them. These can be ordered online from Amazon or the A.D.D. WareHouse (see Appendix for website).

## Parents' needs

Flight attendants always advise passengers that, in the case of an emergency, they should put the oxygen masks on themselves first before assisting their children.

In the same way, before looking at ways of helping your child, it is essential to look at your own needs and concerns. Parents need help in coping with their own feelings and those of their other children, as well as other members of the family.

It is quite natural to feel guilty about your child's difficulties. Most parents report that they imagine that they are in some way to blame for the fact that their child has ADHD. This may be aggravated when they find out that ADHD has a strong genetic aspect to its causation and that it tends to run in families. It is vital to understand that ADHD is due to constitutional factors within your child and is not due to anything that is under your control. Every person carries a wide variety of genes and no one can be held responsible for his or her genetic makeup. Genes, good and bad, are passed from generation to generation in a way that is beyond our control. ADHD genes are common in the community and ADHD is usually due to a combination of genes from both parents.

Because ADHD runs in families, parents have often had similar difficulties to their child; this can be a double-edged sword. On the one hand, having experienced similar difficulties gives you more insight into the problems your child has faced, or may face, in the future. On the other hand, you are likely to identify strongly with your child and may find that this makes it more difficult to cope with the fact that he may go through the same problems, and suffer the same hurt, that you experienced.

If you have the residual form of ADHD that persists into adulthood, you will need to be aware that your own difficulties with impulsivity and rigidity might make it more difficult for you to help your child. If this is the case, you may need professional guidance to help you

manage. However, parents who have had ADHD do have an advantage in that they usually understand their children's difficulties in a way that other parents cannot.

Parents of children with ADHD experience many emotions. They may be hurt by other people's insensitive remarks about their child, they may be embarrassed by their child's difficulties, and they may feel great anxiety about how their child will cope both academically and socially. Many parents feel overwhelmed by the task of teaching their child to overcome his difficulties. They may feel angry much of the time, too—angry with teachers who fail to understand their child's problems and angry with doctors who fail to recognize their child's difficulties.

Despite these difficulties, most parents do cope and find that things become easier with time. It may be helpful to have someone with whom to share your feelings—a friend, a spouse, or professional—someone who will listen sympathetically and not be judgmental or too quick to offer advice.

It can be helpful to meet other parents of a child with similar difficulties. There are now many support groups for parents of children with ADHD and some of these may be obtained from the websites listed in the Appendix. Support groups invite speakers who help broaden and deepen your understanding of your child's difficulties. They will also assist with strategies to manage your child.

Support groups often produce a newsletter and may have a lending library of books and DVDs. The greatest strength of such groups is that they allow parents to meet informally and exchange experiences.

When a professional or other parent provides advice, you should always feel free to reject this if it does not fit in with your own child-rearing practices, or your own family's way of doing things. There is no one single right way of helping children with ADHD, or of coping with the difficulties that you face. There is no single prescription that will work for everyone. Choose those things that seem right to you and fit in best with your way of doing things.

One of the most important things is to try to take one step at a time. Set yourself realistic short-term goals and concentrate on them. Try to avoid looking too far ahead. After all, your child, you, and the opportunities available to you and your child will change in ways that cannot always be predicted.

Children with ADHD cause their parents a lot of stress. It is important to find ways of reducing your own stress levels. Some parents will

attend relaxation classes or stress management courses. Whenever possible, find ways of recharging your own batteries. Difficulties can often be solved when you have a chance to stand back and see things in perspective.

You may also need to develop strategies for coping with other people's hurtful remarks about your child. It is worthwhile giving some thought to this so that you do not find yourself unprepared.

First, you can set an example. If someone says something inappropriate, you can simply repeat what they have said in a more appropriate way. Some parents are helped by giving themselves silent pep talks, such as 'This man doesn't know what he is talking about'.

If you know that you are going to experience a difficult but unavoidable situation, it may be worthwhile rehearsing the situation before it takes place. You may do this on your own or with someone close to you. You will probably decide on a series of responses that are more appropriate than those that would have occurred without rehearsal. Sometimes such responses can be used on subsequent occasions in similar situations.

It is also important to provide information to those around you so that they understand your child's difficulties. It may be helpful to lend a book, such as this one, to a friend who does not understand your child's condition.

## The needs of brothers and sisters

Siblings of a child with ADHD experience special pressures. It is important that they understand the nature of ADHD, that they receive attention of their own from parents, and that they develop strategies to help cope with the attitudes and comments of other children towards their brother or sister who has ADHD.

You should explain to the siblings that the child with ADHD is not lazy or naughty but that he has genuine difficulties in certain areas. Explain how you are trying to help him. It is important that you explain to the siblings that each child is different and that is why you have different expectations and different rules and regulations for each child. If this is explained carefully and carried out consistently, children can understand that they are not being discriminated against when it is necessary to spend more time with, or to show greater leniency towards, the child with ADHD.

If a sibling is being teased about his brother or sister, it is important to acknowledge how hurt he must feel. Encourage him to express his anger and resentment, and respond sympathetically to his feelings. It is often difficult for a sibling to ignore unkind comments from his peers. It may help your child to imagine that he has an 'electric forcefield' surrounding his body that deflects any insults before they get to him.

It may be beneficial to ask the teacher to provide some help, too. Sometimes a teacher can initiate a discussion about 'being different' or 'having difficulties' that may change the attitudes of other children.

The sibling of a child with ADHD may also benefit from the books written for siblings of children with ADHD. These can be ordered online from Amazon or the A.D.D. WareHouse (see Appendix for website).

## Improving your child's self-esteem

Children with ADHD are often very hard on themselves. They appraise themselves harshly and are quick to blame themselves for things that go wrong. This is partly related to immaturities in certain parts of the brain (see Chapter 7). In addition, children with ADHD are often failing academically and socially. It is, therefore, important that parents help children build up their self-esteem as much as possible. This is important as many of the unwanted behaviours seen in children with ADHD (e.g. school avoidance, homework avoidance, TV and computer game 'addiction', cheating, aggression, controlling behaviour, bullying, quitting, and depression) are maladaptive responses to low self-esteem.

The most detrimental effect of low self-esteem is that it encourages a child to enter a cycle of failure in which his ability drops lower and lower. The child tries to evade failure by avoiding challenges. This results in poor attainments that reinforce the child's feeling of inadequacy. By contrast, a child with better self-esteem will be able to try harder because he is not so frightened of failure. Because children with ADHD appraise themselves so harshly, parents need to try to boost their child's self-esteem.

Many a parent of a child with ADHD has praised their child in the hope that this would bolster his or her self-image, only to find that the child reacted adversely to it. The reason is that, because the child feels so inadequate, the praise reminds him of how poor his achievements are. Children with low self-esteem are often quick to

misinterpret parental praise as being patronizing. Some children with ADHD are so insecure that they interpret praise as implied criticism or suspect that they are being compared with another child.

Yet parents need to develop their child's self-esteem. If a child with ADHD has not attained good self-esteem by adulthood, he will derive little value from any success that he attains. With high self-esteem, he will probably cope well with life, even though some difficulties persist. Self-esteem builds resilience.

How can you, as a parent, engender high self-esteem in your child with ADHD? First, you should accept your child for what he is; that is, the sum of his strengths and weaknesses. You need to see him in terms of his own uniqueness. Try to see within him the potential that he will realize at his own pace.

The role of every parent is to encourage, enjoy, and value their child. Try to avoid basing your own feelings of self-esteem and worth on your child's behaviour. Your child needs love that is not conditional upon his achievement. You also need to accept his feelings without criticism.

Try to emphasize his positive attributes and show how you value them. He needs plenty of praise for his efforts. However, do no overdo this or persist with praise if it clearly makes him feel uncomfortable. When praising, make it clear what you are praising him for. Avoid general comments such as 'Well done' or 'Good boy', but rather say things such as 'You spelled that difficult word very well' or 'That was excellent reading'. Praise effort and not just achievement. However, when you praise effort, make it clear that it is effort you are praising. The child who tries very hard, but reads hesitantly, should be praised not for 'reading well', but for 'having a very good go'.

Children learn self-esteem from their parents' example. This is one of the reasons that children whose parents have high self-esteem are more likely to have high self-esteem themselves. You need to have faith in yourself. Let your child hear you praise your own accomplishments ('That was a job well done').

It is most important that you encourage your child to set realistic goals so that he can experience success. Help him to evaluate his achievements realistically so that he is not over-critical of himself. It is important to set achievable goals at the start of any activity. If your child is going to attempt something that is too difficult for him, guide him to a more suitable activity in a tactful way. You should also teach your child to praise himself. If he achieves something, ask him 'How

do you think you went?'. Teach him also to praise others (e.g. 'What do you think of Dad's salad?').

Children benefit from having special time with both parents. Often one parent will have little opportunity for special time. This may be because that parent is so busy with home duties and chores, or with work outside the home, that there is never time to spend with the child. Both parents should plan ways in which children will have some special time with each of them. Special time does not necessarily mean that you must organize activities away from home. It is time when you can give your attention your child in a way that builds up his self-esteem. The important thing is that it should be enjoyable for the child and that he should be receiving your full attention.

Where parents are separated, children will have better self-esteem if they are not used as a weapon between the parents. Parents owe it to their children to ensure that they work out peaceful and stable access arrangements, even if this means some compromise on the part of one of the parents.

Children also need to feel that they belong to something. It may be an idea to arrange for your child to join a hobby group, a scout pack, or some other such unit. Encourage him to be proud of his school, his neighbourhood, and his ethnic tradition.

Children need to feel that they have the power to make some of the choices that affect their lives. Whenever possible, let your child select things for himself, such as which clothes he wears, in what order he does things, and which books he takes from the library. Admire his choices and praise his self-sufficiency.

Another way of increasing your child's self-esteem is by enriching his experiences. Take him on excursions, teach him to do new things like gardening, or make a photo album with pictures of him. Give him opportunities to become self-reliant. Teach him to make small purchases on his own, to answer the telephone, and to take responsibility for some household task.

## Your role as a teacher

Parents have an important role in helping their child to learn. They teach by example, often without realizing it, and in a more direct way. For a child with ADHD, the parents' role as teacher becomes even more important. No other teacher can spend as much one-on-one time with a child. No other teacher can extend what the child has learned in so many different situations. However, a child's

relationship with his parents is generally so much more intense than with any other teacher that parents should approach teaching with care. Most parents can be good at teaching their child, provided they make this a positive and constructive experience for the child. This means that the parent must be prepared to put some thought into how to become an effective teacher.

Before you teach your child, you should liaise with his class teacher, who will ensure that what you teach complements what is being done at school. A good teacher will be happy to give you guidance about what to teach and how to go about it. He or she will be only too aware that there is usually insufficient time to give adequate individual tuition to each child in the class.

When you teach your child, do not overdo it. Short daily sessions are much better than infrequent long sessions. Attempt small units of work at a time. Do ensure that you are teaching your child the things that he is learning at school. You do not want to add to his burden by increasing the amount he has to learn. Aim to make those things that he already has to do at school easier.

Choose a time when you are both feeling calm. You need a quiet environment where you will not be disturbed. It may be necessary for you to arrange for your other children to be occupied somewhere else. Do not have a teaching session when you are doing something else, while the TV is on, or when siblings are around.

Try to make sessions as enjoyable and as varied as possible. Start with a revision of the previous work and explain what you hope to achieve in this session and why it is important. Work slowly and patiently. Sometimes your child will seem to have a block or forget things that he knew the previous day. Take this in your stride. It is perfectly normal for children to progress slowly, with sudden spurts followed by protracted periods of comparatively little progress. During these slow phases, children are often consolidating skills before going on to the next stage.

Because children with ADHD must work so hard to concentrate, you may need to have frequent breaks. Some children benefit from having a chance to burn off excess energy before they start work. Other children will become so excited by physical activity that they then find it difficult to settle down to do homework afterwards. Children with ADHD who have difficulty in focusing after intense physical activity may be better working first and engaging in physical activities later.

The child's medication schedule is important when considering the best time to do homework or study. For example, a child who takes short-acting dexamphetamine or Ritalin (methylphenidate) in the afternoon should probably start working approximately one hour after the tablet has been taken. In this way he will be most settled when needed.

When working with your child, always be encouraging, and never critical. Avoid expressions such as 'Hurry up', 'Watch what you're doing', 'Don't be careless', and 'You have seen that word before'. Instead, use phrases such as 'You are really improving at reading' and 'You really worked hard on this'.

Whenever you have a teaching session with your child, end it with an activity that he is good at and enjoys. At the end, do not forget to say something like 'That was fun! I look forward to doing some more with you tomorrow'. When the session is over, try to stop playing the part of the teacher. You are more than a teacher; you are a parent as well. Parents cannot treat every interaction with their child as an opportunity for teaching without the relationship becoming stilted and the child becoming resentful. There must be opportunities for unstructured interaction.

Teaching must concentrate on the child's areas of weakness. Most children are aware from an early age of things they find difficult. We all prefer to do those things at which we excel. Make certain that you give your child ample opportunities to do those things that he is good at, in addition to those he finds difficult. This is essential for his self-confidence.

Some parents do not have the time or the ability to teach their child. In this case, it is usually best to find a teacher or coach to help your child after school. It is important to choose someone with the skills and temperament to do this well. Support organizations often have lists of suitable teachers. The names of some national organizations (where you may find the contact of your local group) can be found via the websites whose addresses are listed in the Appendix.

## Working with the school

It is best to regard yourself, the teachers, and other professionals (such as speech therapists) involved with your child's education as a team. Each member of the team plays a part in providing the best education for the child. It is essential that you and the other members of the team communicate regularly.

Some schools have a file for each child that is passed on to his new teacher each year. In addition, you should arrange a meeting with your child's new teacher at the beginning of each year. At the meeting explain your child's difficulties and give the teacher copies of any assessments done in the past.

During the year, keep in regular contact with the teacher to find out how your child is progressing. It is a good idea for the child's homework diary to be used as a 'communication book' in which you and the teacher can exchange information on a regular basis. Some teachers may be prepared do this by email, which has the advantage in that the parent–teacher communication bypasses the child. You should not hesitate to request a special meeting with your child's teacher if there is something causing you concern. Do this as early as possible.

It is sometimes possible to apply for funding for special teaching sessions at school for a child with ADHD. These may be given in the class or in a resource room. The child may either receive individual help or be part of a small group of children with similar difficulties. If you think this may be possible, check with your child's teacher to see whether it is available. Some schools have an arrangement whereby parents come to the class and help children with their reading or other work.

Try not to become involved in discipline issues that should be the domain of the school. If a child is misbehaving at school, the teachers, possibly with the aid of the principal, should develop strategies for dealing with this. The school may need to call upon a psychologist attached to the school if such expert advice is needed.

As a parent, it is probably best if you are not put in the position of having to punish your child for misdemeanours at school. This only increases stresses at home and creates negative interactions between parent and child. While you should always be prepared to go to the school at the teacher's request to discuss behavioural problems, you should try wherever possible to encourage the school to deal with these problems, while you deal with the behaviour problems you observe at home. Often the best role for a parent of a child who is behaving badly at school is to provide him with a happy home environment where he is given unconditional love. In this way behaviour at school may improve as the child's self-esteem is built up.

# 13

# School management

## Key points

- It is important that the teacher should create a proper learning environment for the child with ADHD in the classroom.
- It is also essential that the child with ADHD be adequately catered for in the playground.
- The teacher of a child with ADHD should keep in regular contact with the child's parents.
- Teachers have a vital role in monitoring the positive, as well as the negative, effects of ADHD medication.

The average school-aged child spends well over a third of her time in school. A child's experiences in the classroom, and in the playground, will affect her academic attainments, the development of her self-esteem, and her social skills. Since these are the areas where children with ADHD have difficulties, it is essential that teachers and principals understand how best to help children with this common disability.

In the past, teachers often had little understanding of the needs of a child with ADHD. Such children were labelled as 'lazy' or 'bad', and often dealt with harshly. Problems with learning and social skills were not detected early and children were not assessed adequately. Parents were often blamed for their child's difficulties. Those parents who arranged for their child's difficulty to be properly assessed and diagnosed often found that teachers and principals had never heard of ADHD. Educational programmes were not implemented, and schools were often uncooperative with medication regimes.

Now there is a growing awareness of ADHD within the educational system. Teachers increasingly are being taught about ADHD in their university training and in-service courses. Many education

departments have produced guidelines and information booklets about ADHD for teaching staff.

The interested teacher can also gain access to several books about ADHD, written especially for teachers. There are also many DVDs that give an insight into appropriate teaching techniques. Such books and teaching materials may be ordered online from the A.D.D. WareHouse (see Appendix for website address) and Amazon.

Unfortunately, there are still teachers who are ignorant of ADHD. Many of these teachers will be eager to become informed about ADHD when they realize that they have a child in their class with the condition. Other teachers, a decreasing minority, will claim that they 'do not believe in ADHD', or that they are 'against' certain treatments, such as medication. Such teachers may prefer to blame parents for the child's difficulties, claim that the child is lazy, or believe that punishing the child will remedy the problem. They may have misconceptions about the role of medication in this disorder and be ignorant of the literature on ADHD. Some have a misconception that all children with ADHD are constantly active, and do not understand the wide range of difficulties seen in children with this condition.

## Which school?

Choosing a child's school usually requires some degree of compromise on the part of the parents. Whatever your final choice, it is unlikely to be perfect. Schools rarely are. What you need is to find is the best alternative for your child at that stage of her education. Always keep in mind that no placement needs to be permanent. Regular reviews should be undertaken, and your child could move to a more appropriate class or school if her needs are found to have changed.

All things being equal, a child is usually best placed at a school that is near to her home. Besides making transportation easier, this also gives the child an opportunity to meet and mix with neighbourhood children with whom she will be able to play after school.

It is essential that the principal of the school has a good understanding of ADHD. He or she should know about the condition, have an enlightened attitude towards comprehensive assessment, and be prepared to implement a multi-modal treatment plan, which includes behaviour management, special educational help, and medication. If the principal does not understand ADHD, it is going to

be extremely difficult to ensure that the child receives appropriate help.

The classes in the school should, preferably, not be too large. It is very difficult for one teacher to help a child with ADHD if there are more than 30 children in the class. Classrooms should be closed spaces (not open plan). Seating should be in rows with children facing the teacher, rather than with desks placed in small clusters.

The school should be structured with clear-cut rules that children can understand. School programmes that allow children to come and go as they please, and to choose which activities they want to take part in, are often not appropriate for children with ADHD.

Children should be in classes grouped by age so that they have a feeling of belonging with their peer group. Composite classes and *vertical streaming* systems are usually confusing and distracting for most children with ADHD.

It is best if children are streamed according to ability for each individual subject. This allows children who are weaker in a particular subject to receive extra help and to work at an appropriate pace. It also enables a child to have the satisfaction of moving up to a higher stream as she improves.

The school should employ support teachers for children with learning difficulties so that they can receive extra help within the ordinary class. The classroom teacher should understand ADHD and be able to implement the strategies discussed below for helping children who are experiencing difficulties.

## Effective strategies for teaching children with ADHD

### Diagnosis and assessment first

It is essential that a child who is experiencing difficulties in the classroom or the playground should first have an adequate assessment before any management plan is formulated. Such an assessment involves a developmental paediatrician and psychologist (see Chapter 11). No management plan should be devised until such an assessment has been carried out to establish the child's particular strengths and difficulties, and to identify the cause or causes of the child's problems.

### Teachers' attitudes

To manage a child with ADHD properly, a teacher must learn what it is like to be a child with ADHD. The teacher should also have some insight into his or her own makeup and response to the child. Some teachers have a natural ability to empathize with children who have ADHD and find it easy to get the best out of such children. Other teachers may find that they become angry and frustrated with children with ADHD, and that their natural teaching style, which may be successful with children who do not have this condition, is not suitable for children with ADHD.

A teacher who feels frustrated by the difficulties presented by a child with ADHD, who finds it difficult to carry out a behaviour management programme, or make classroom adjustments for the child with ADHD, should turn to the school psychologist. With regular consultation with the psychologist, the teacher should be able to gain insight into his or her difficulties and develop better strategies for overcoming these.

## Classroom accommodation

It is important that the teacher should create a proper learning environment for the child with ADHD. The child with ADHD should be seated in the front of the class near to the teacher's desk. The teacher should ensure that the child's seat is part of the regular class seating and not separate from the other children. By placing her at the front, the teacher can ensure that he or she has the child's attention. This position also has the advantage that the child with ADHD will have her back to the rest of the class so that other students are less likely to distract her. The old ideas of putting the 'naughty' child at the back of the class or letting such a child seat herself at the back of the class are inappropriate if the child has ADHD.

It is a good idea to place children who will serve as good role models on either side of the child with ADHD. The child with ADHD will learn from example, and benefit from copying the behaviour of the children around her; she will also be less distracted by them if they are well behaved and have good work habits. The teacher can make the most of the proximity of these good role models by encouraging peer teaching and cooperative learning.

Wherever possible, the teacher should keep the child with ADHD away from distracting stimuli. The child should be seated well away from distractions, such as an air-conditioner or window.

Children with ADHD do need to be in an interesting environment, but the teacher should avoid creating a learning environment that is too

busy or cluttered. Rather than filling the classroom with posters covered with information, and objects such as mobiles, the teacher should aim to make the classroom interesting but muted in tone. School bags should be placed at the back of the class out of the way, and the desks and boards should be kept uncluttered.

## Giving instructions

Children with ADHD have poor listening skills and it is important that teachers understand how to give instructions to their students with ADHD.

First, it is important to gain the child's attention. It is usually necessary to stand in front of the child, and even to touch the child, to ensure that she is able to listen to you. Do not insist that the child looks at you, however, as children with ADHD often have low self-esteem and find it difficult to maintain eye contact. To force the child to look at you may only make her feel extremely uncomfortable and she may be unable to concentrate on what you are saying.

Unfortunately, some teachers regard a child's failure to look at them as rudeness and punish such children. Teachers should not say things such as, 'Look at me when I am talking to you!' to a child with ADHD. Children who avert their gaze, or look downward, may not be rude at all, but simply embarrassed and uncomfortable.

The instructions should be as brief and clear as possible. Avoid giving instructions that contain several different parts, such as 'Go to the back of the class, open your bag, and take out your maths book!'. It would be more appropriate simply to say: 'Go to your bag'. Then, once the child is at her bag, say 'Take out your maths book'. Children with ADHD have problems with short-term memory and find it extremely difficult to retain a two- or three-part instruction.

It is always important to ensure that the child understands an instruction before beginning the task. It may be necessary to repeat the instruction. This should be done in a friendly, calm manner.

Unfortunately, many children with ADHD do not ask for help and a teacher should always try to create an environment where the child with ADHD will feel comfortable seeking assistance.

Children with ADHD often have difficulty carrying out instructions because of their poor organization skills. It may be necessary for children to have colour-coded books for each subject. They may need a list of the steps required to carry out instructions.

It is essential that teachers ensure that the child is supervised when writing down her homework and that parents know how to check this work. A child with ADHD who is asked to do a task should have regular monitoring to ensure that she knows what is expected and that she is succeeding. With all instructions, the teacher should ensure that the child is capable of carrying out the task and that it is not beyond her abilities.

## Modifying work and examinations for the child with ADHD

Teachers should ensure that children with ADHD are tested on their knowledge and not unfairly penalized for their difficulties with concentration. It is important not to overload the child with tasks that need a great deal of persistence. For example, it may be necessary to shorten the work so that the child only does every second mathematics problem.

When setting out questions for the child, these should be given in 'bite-sized' sections, rather than giving the child a page filled with questions. The tasks should be broken up into smaller stages, each one on a separate piece of paper; each sheet is then given to the child separately.

It may be important for the teacher to consult with the school counsellor or special education teacher/SEN contact to modify assignments and homework according to the child's particular areas of strength and weakness. The development of an individualized education programme for the child may be necessary.

It may be best to give the child extra time to finish examinations. Children with ADHD are easily frustrated and do poorly under the stress of an examination. They also find it very hard to write down their thoughts on paper and usually do better in a multiple-choice examination rather than the essay type.

In any examination, it is important that the teacher be available to answer queries. Children with ADHD are less likely to seek assistance and it may be important for the teacher to keep an eye on what the child is doing in a discreet way and to be able to guide the child if she has misunderstood the question.

## Behaviour management

Chapter 14 describes behaviour modification for parents. Teachers can implement the same sort of programmes with children who have

specific behaviours that are causing difficulties.

It is essential that a teacher be able to talk to a child with ADHD in private to discuss things that may help the child. The teacher should be able to take the child aside in a way that is not obvious to the other children in the class and be able to discuss areas of behaviour that are a problem. This should be done calmly so that child and teacher can develop some strategies together. Clear consequences for misbehaviour should be established from the outset and the child and teacher should discuss together the methods of monitoring the behaviour. Discipline should always be appropriate to the misdemeanour and not unnecessarily harsh. Reasonable allowance should also be made for periods of difficulty.

It should always be remembered that children with ADHD manage transitions poorly and some allowance should be made for this. Such transitions include periods when they come into the classroom after breaks, when they move from one classroom to another, or when they have a new teacher. They are liable to become overexcited when they are due to have some activity that they enjoy, such as an outing or a sports event, and this should also be taken into consideration.

In all situations, the teacher should aim to help the child's self-esteem. Ridicule and criticism should always be avoided. Rewards should be used liberally to help build up the child's self-esteem. Rewards should be given as soon as possible after wanted behaviour has been demonstrated. Teach the child to reward herself by encouraging positive self-talk ('You finished the job very well. How do you feel about that?'). This sort of cognitive restructuring encourages the child to be more positive about herself.

Wherever possible try to encourage the child to monitor herself. This teaches her self-control. Self-monitoring requires that the student observes her own behaviour and records the observations. It is helpful for the student to compare her ratings with those of the teacher.

## Extra help for children with ADHD

Children with ADHD are often behind in one or more areas of academic attainment. They may, therefore, need some individualized help. Children with ADHD usually learn well in a one-on-one situation and may make rapid strides if given some individualized attention.

Teachers may be able to find time during the school day when they can sit down with the child and provide help on a one-on-one basis. If

this is not available, or if the teacher cannot provide sufficient help in this way, it is important to look for other ways of giving the child such assistance.

Schools may be able to fund a special needs teacher who provides help on a one-on-one basis to children with learning difficulties. If this is not available, the teacher should consider whether a volunteer can provide this kind of help. Such volunteers may be parents or senior citizens. A good teacher will know how to utilize a volunteer in the classroom. This may be through training the volunteer to give one-on-one help, or by letting the volunteer take over some other aspect of running the class so that the teacher can spend more individual time with the child who has ADHD. Volunteers must be trained, supervised, background checked, and treated in a professional manner. They need to be made aware that all information pertaining to a student must be treated in a confidential manner.

When children are clearly unable to receive sufficient help for their difficulties in the classroom, teachers should advise parents to arrange for extra help outside of school hours. With so many children in most classes, it is often necessary for children with learning difficulties to receive help from a tutor on a regular basis after school. It is best if the classroom teacher ensures that such help is appropriate.

The teacher may be able to recommend and then be prepared to meet with an appropriate tutor to ensure that work in the classroom can be reinforced by the tutor. It is essential that the tutor should make the child's schoolwork easier for him, and not add extra or different work for the child to do.

## The teacher and the child's medication

Teachers have an important role in supervising the administration of medication for children with ADHD and in monitoring the positive, as well as the negative, effects of such medication. To do this effectively, the teacher should understand the important role that medication plays in helping children with ADHD. The teacher who is ignorant about the potential advantages of medication for such children will not be able to take on this role.

The teacher should understand that medication is one of the components of helping the child. It is to be used together with other strategies to get the best results.

It is important that children who take medication for ADHD should not feel self-conscious about this. Teachers should never remind

students publicly to take their medicine. In some cases, children can supervise the administration of their medication on their own, and teachers need play no part in the actual administration. For younger and less capable children, the teacher may need to ensure, in a discreet way, that the child takes his tablet. In all schools, children take medication regularly for conditions such as asthma, and it should be quite usual for children to take medicine in the classroom, or to go up to one of the offices to take medication. Teachers should ensure that this can happen without any fuss.

The taking of medication should never be alluded to at other times. Certainly, a teacher should not comment on the child's performance in relation to whether medication has been taken or not.

Teachers and principals are often concerned about a child having medicine in his possession. They are concerned that some other child may get hold of the medicine and take it. First, it is not necessary for a child to have in her possession at school more than a single dose of the medicine. This is usually the tablet taken at recess or lunch. It is extremely unlikely that another child would take this tablet, but, if one did, no harm would come to the other child. A single dose of any of the medicines taken for ADHD would be safer than taking a single dose of almost any other medicine used in paediatrics (including penicillin). However, all children should be taught from an early age not to take other people's tablets.

Teachers also have the important role of monitoring the effects of medication. There are now several checklists that teachers can use to tick off the effects of medication that they observe. Teachers are well placed to notice effects, both good and bad, that result from medication. Table 13.1 shows a rating scale that teachers can use for this purpose.

**Table 13.1** Medication effects rating scale

| ***Behaviour*** | **Never** | **Occasionally** | **Appropriate for age** |
|---|---|---|---|
| Attentive to teacher | | | |
| Attentive to task | | | |
| Completes assigned work | | | |
| Impulsive | | | |
| Organized | | | |
| Overactive | | | |
| Talkative | | | |
| Work is neat | | | |
| Disruptive in class | | | |
| Accepted by peers | | | |
| Carries out instructions | | | |
| Follows routines | | | |
| Has tantrums | | | |
| Aggressive | | | |
| Stays in seat | | | |
| Rude to teacher | | | |
| Remembers work | | | |
| Tries hard | | | |
| Makes negative comments about self | | | |
| Obeys rules | | | |
| ***Side effects*** | **Never** | **Mild** | **Severe** |
| Stares into space | | | |
| Subdued | | | |

| *Behaviour* | Never | Occasionally | Appropriate for age |
|---|---|---|---|
| Sad | | | |
| Withdrawn | | | |
| Anxious | | | |
| Irritable | | | |
| Headaches | | | |
| Abdominal pain | | | |
| Tics | | | |

If the teacher notices untoward reactions, these should be reported to the parents. With the parents' permission, it may be necessary for the paediatrician and teacher to discuss the effects of the medication so that the dose can be adjusted.

Sometimes, children with ADHD show an improvement in their concentration at the expense of becoming subdued by the medication. In consultation with the teacher, the paediatrician can lower the dosage so that the positive effect on concentration remains, while the subduing effect of the medication disappears.

It is unfortunate that there are still many teachers and principals who are negative about medicine for ADHD. Because of this attitude, paediatricians and parents may decide not to involve the teacher in monitoring the child's medication. They may even decide not to tell the teacher that the child is taking medication for fear that he or she will react in a negative way and make the child feel uncomfortable about his treatment. In such a situation, the teacher is doing the child a great disservice. Such teachers are, by their attitudes, disqualifying themselves from playing an important role in a vital aspect of their pupil's education.

## The playground

In the same way that it is important to provide an appropriate learning environment for the child in the classroom, it is important that the child with ADHD be adequately catered for in the playground.

Children with ADHD often need supervision in the playground so that they do not cause problems to themselves or others. This supervision

should be carried out in such a way that the child with ADHD does not feel she is being singled out.

If the child with ADHD wishes to play with younger children in the playground, this should be allowed. Often children with ADHD have more in common with younger children and feel happiest in that social setting. Provided that they are not causing any disruption or harm, they should be allowed to play with any child.

If a child with ADHD is having difficulties getting on with other children, it is useful to arrange for the school psychologist to talk to her about effective strategies for getting on with other children. It can be difficult for the child with ADHD to apply these strategies, but such intervention may pay great dividends.

Children with ADHD usually benefit from individualized activities that are non-competitive. Many do not do well in team sports. The child may be encouraged to take part in games such as Tee-Ball and trampoline if these suit her abilities.

## Working with parents as a team

The teacher of a child with ADHD should keep in regular contact with the child's parents. Sometimes this is best done through a communication book, the child's school diary or, best of all, email. For confidential matters, a special meeting should be arranged.

The aim of the parent–teacher communication is to ensure that everyone is aware of how the child is progressing and what steps are being taken to help the child in the school and home environments. It also gives teachers an opportunity to speak to parents about ways of helping the child with her work at home. Teachers can encourage parents to help the child with her schoolwork and to review completed homework. It also allows the teacher to suggest whether remedial help is needed after school.

Parents can play a role in ensuring that their child's books and bag are organized and that any difficulties with homework are conveyed to the teacher.

Parents should not have to punish children for misdemeanours at school. Parents should also not have to punish children for homework that is not done. Although many educators favour what is known as a *home- and school-based contingency programme* (where the parents administer rewards and consequences at home, based upon a teacher's assessment), such programmes are inappropriate for most, if not all, children with ADHD.

There are several drawbacks to home- and school-based contingency programmes. First, children with ADHD have great difficulty delaying gratification long enough to receive rewards at home for behaviour at school. Second, it seems inappropriate that a child who has been well behaved at home, but had a bad day at school, should be punished by his parents. By rights, parents should, in this situation, be rewarding the child for his good home behaviour. Third, children with ADHD are unreliable about bringing teacher's report cards home. Furthermore, because parents are not present at school, they are at a great disadvantage if the child wants to defend her actions that took place at school. Parents cannot be sure whether the behaviour was misinterpreted, misunderstood, or was a reasonable response to provocation. It is, therefore, the teacher's role to monitor behaviour at school and to deal with this appropriately.

# 14

# Behaviour modification

## Key points

- The first step in a behaviour modification programme is to observe your child's behaviour and identify the behaviour you want to change.
- One of the advantages of medication is that it allows children to be more successful in a behaviour modification programme.
- If you fail in behaviour modification, do not hesitate to consult your doctor, and ask for a referral to a psychologist.

Behaviour modification is a form of teaching that is employed in situations where explanation alone does not succeed. Most parents practise behaviour modification without realizing it. They do this by rewarding their child for good behaviour and punishing him for bad behaviour. Some parents need help to do this in the most effective way. Children benefit from knowing where they stand and being able to direct their energies into more constructive and rewarding activities.

**Step 1: Identify the behaviour**

The first step in a behaviour modification programme is to observe your child's behaviour and identify the behaviour you want to change. You need to avoid general statements about your child such as 'He is impossible'. Instead, focus on specific things he does that worry or annoy you, for example, not getting dressed in the morning, or fighting with a sibling.

**Step 2: What kind of behaviour is it?**

There are two kinds of behaviour: good behaviour, which you want to encourage, and undesirable behaviour, which you want to get rid of. In the examples in Step 1, the good behaviour you want to encourage is getting dressed in the morning and the undesirable behaviour you want to get rid of is fighting with the sibling. Ideally, it is always best to teach a child a useful skill to replace an unwanted behaviour. For example, if a child is fighting with siblings, try to think of an alternative behaviour that the child can become involved in to replace this.

**Step 3: Examine antecedents and consequences**

This way of looking at behaviour is sometimes known as the 'ABC' method:

**A**ntecedents, which are those triggers that encourage unwanted behaviour;

**B**ehaviour, which needs to be carefully defined; and

**C**onsequences, which are those things that happen because of the behaviour.

It is important to work out which consequences maintain a behaviour, i.e., what keeps the child behaving in this particular way.

In the example in Step 1, if every time the child with ADHD hits his sibling, he receives attention from the parent—even if this attention is negative attention (such as shouting)—this may reward and reinforce the undesirable behaviour. Children enjoy attention, and if the only sort of attention they can get is negative attention, they will continue behaving in such a way as to receive it.

## Encouraging and rewarding good behaviour

It is important to encourage desirable behaviour, which can then be rewarded. Often, children with ADHD rarely demonstrate desirable behaviour, and parents have difficulty finding something that they can reward. Medication may play an important role in this regard, in that children with ADHD may only start behaving in a desirable way once they are on medication.

One way of encouraging good behaviour is to demonstrate the behaviour to the child in the hope he will imitate it. Some children are more inclined to imitate behaviour than others. Your child may copy

the parent he identifies with more strongly, and you should take advantage of this. Children also tend to copy other children. It is useful to encourage your child to interact with good role models whom he may imitate.

Another way of encouraging good behaviour is by modifying the child's environment. If a child takes a long time to dress, ensure his clothes are set out so that they are easy to put on, that the room is warm, and that there are minimal distractions.

If, as sometimes happens, the correct behaviour suddenly occurs, you should take advantage of this and reward the child immediately. If you are alert, you may 'catch' your child demonstrating a good behaviour and you can then reward it.

## How to reward good behaviour

How should you reward your child? The simplest sort of reward would be to praise what the child has done by making a fuss, smiling, and saying 'well done', or 'quick dressing', or 'good reading', and so on.

Note that 'good' is used to describe the behaviour, not the child. This emphasizes what you are praising and does not in any way reflect on the child's worth. These simple verbal rewards should always be given and are often more powerful than parents realize. In some cases, however, they are not enough on their own. The older the child, the less likely that this simple kind of reward will suffice. In this case, you need to provide some tangible reward. This may take the form of a star on a chart, a hand stamp or sticker, a sweet, a special toy, or an outing. With more sophisticated children, it may be necessary to have a system where a specific number of small tokens earns something a little larger.

Beware of the trap of making the reward too big or too expensive. You should not make it too easy to get big rewards, although you should make it reasonably easy to earn lesser rewards, to encourage the child. Sometimes a reward system is best run along the lines of a *response–cost* system, where the child forfeits some tokens when unwanted behaviour occurs.

Children with ADHD often benefit from a system where they initially receive all the tokens for the week, or day, so that they can see the reward from the outset. They are then required to give up a certain number of tokens that they have in their possession whenever they display unwanted behaviour. This works well because children with

ADHD have trouble working towards a reward that will only become available to them at some future time.

In all cases, stamps, tokens, or charts should be available at the outset. Once the behaviour modification programme is in operation, you will need to revise the reward system if the child waits too long for a reward or received too many rewards.

Keep up this tangible reward system until the child loses interest, which he will invariably do once the desired behaviour is established. Do keep up the praise, however, even when tangible rewards are no longer given.

## How to discourage undesirable behaviour

Discouraging undesirable behaviour causes parents much difficulty and confusion. Without realizing it, they often reward the bad behaviour, or use ineffective ways of eradicating unwanted behaviour.

The most common *ineffective* method is to scold the child or to argue with him. Most parents would agree that this is not usually successful. The reason is that, for many children, any attention from their parent acts as a reward. Children thrive on attention, and always seem to want more. They prefer praise, but any attention, even scolding, can be rewarding for a child. (An analogy for this is that children usually like crisp potato chips; however, if only soggy potato chips are available, they will usually eat them.)

Some parents resort to smacking their child, but usually find that this does not help for long. This may make parents distressed, as they regard smacking as the most extreme action they can take. The reason why smacking does not seem to work is probably because it *is* such an extreme thing to do. Although it is unpleasant for the child, it is also unpleasant for the parent and most children realize this. After the smack, parents invariably feel guilty; when the pain caused by the smack has subsided, the child may enjoy the sympathy he senses from the remorseful parent. Smacking may, therefore, work for the moment, but usually does not eradicate a recurrent behaviour.

### Pretending to ignore

What can parents do when these traditional methods do not work? Parents may need to learn that often the best thing to do is *to do nothing.* Children thrive on attention, even in the form of shouting and

smacking. By withholding attention, many behaviours will diminish or disappear. Ignoring behaviour is a difficult thing to do; in fact, it is questionable whether parents can ever completely ignore their child's behaviour. You can, however, *pretend* to ignore the behaviour if it is not too dangerous or disruptive. To do this you have to stifle your natural responses, avoid making eye contact with the child, and look calm. Busy yourself with some activity unrelated to the child and refuse to become involved in any discussion or argument about the behaviour that you are trying to eradicate. When the child has stopped demonstrating the behaviour, invite him to take part in what you are doing and resume normal conversation with him. Do not show annoyance once you start interacting with him again.

## Time out

In the case of behaviours that are too destructive, or possibly dangerous, you cannot pretend to ignore your child because of the concern that he may injure himself, damage something, or hurt someone. You may be so angry with him that you may be afraid of losing control and harming him. In such situations, you must remove the child to a place where he can no longer receive the reward of your attention.

This technique is known as *time out*, and consists of insisting that the child stay on his own for a while. The aim of using time out is not to create discomfort or fear in the child but simply to remove him from the place where he is receiving reinforcement for what he is doing. Usually the most convenient place for time out is the child's bedroom. Leave him there until you have both calmed down. While the child is there, any shouting or screaming should be ignored.

It is important not to allow the child out until he has quietened down; otherwise he may get the idea that he has been allowed out because of his screaming and shouting. You can either tell the child in a calm voice that you will not allow him out until he is quiet, or if he does not understand this and will not cooperate, you can wait until there is a pause in his crying and then allow him out.

Some children are so destructive in their own room that it may be necessary to pick another room in the house. Concern is sometimes expressed that, if a child spends time out in his bedroom, he will develop a bad association with it. In practice this does not seem to occur.

At the end of a period of time out, do not demand apology or engage in recriminations. Be friendly and matter of fact.

One should never use time out without giving some thought to the quality of interaction that you have with the child when you are together. In other words, one should be thinking not only of time out, but also of *time in* (quality time). Wherever possible, you should try to ensure that the time your child spends with you promotes positive interactions and encourages wanted behaviour. You do not need continually to entertain your child or spoil him during the time he is with you. However, you must ensure that he is getting sufficient quality time with you so that he is not forced to get your attention through undesirable behaviour.

It is easy for an exhausted and stressed parent to find that they are not giving their child good quality time. Quality time simply implies that you are giving your child your undivided attention and that both of you are enjoying yourselves.

### Extinction

There are some situations where a child becomes used to being rewarded for an unwanted behaviour. An example is prolonged calling out at night that eventually results in the desired parent's appearance in the room. The withdrawal of such a reward is called *extinction*.

There are two ways of doing this: abrupt withdrawal or gradual withdrawal. The latter is sometimes referred to as *controlled crying* and is usually favoured. In this method, you need to wait for longer and longer periods before returning to your child. The attention given to the child on your return should be minimal.

With extinction, you should be prepared for the behaviour to worsen initially. This usually lasts a few days, and, if you hold firm, the behaviour will rapidly diminish and disappear. After a variable period, there is often a reappearance of the behaviour, as if your child is testing whether the new rules still apply. If you are consistent, the behaviour will cease.

Before embarking on an extinction programme, both parents should prepare themselves for a trying time. During the period when the behaviour worsens, it is important to support one another.

## Important considerations in a behaviour modification plan

Behaviour modification is straightforward in theory—encourage and reward good behaviour, discourage bad behaviour. However, in practice it can be very difficult, particularly as children reach adolescence.

First you should always consider the fact that a child with ADHD has an inefficiency of the brain that means that he has less control over his behaviour. Always assess your child's behaviour and decide whether the child is *able* to change or not, given his difficulties. Your paediatrician or psychologist who carried out the diagnostic assessment will be able to guide you.

One of the great advantages of medication is that it allows children to be more successful in a behaviour modification programme because desirable behaviours increase, and unwanted behaviours decrease.

You should be as consistent as possible. Decide on the limits of what your child may and may not do, and then try to stick to them. Complete consistency is, of course, impossible, but aim for as much as you are able. You should not be discouraged if others do not set the same limits as you do. Children with ADHD can accept different limits from different people. What confuses them is when one person acts inconsistently.

Always ask yourself if some practical change would make a behaviour easier to manage. This may be simpler than embarking on a behaviour management programme. For example, behaviour management could be tried with a child who continually enters an older brother's or sister's bedroom and untidies it. However, the easiest way to resolve the problem may be to put a bolt and combination lock on the sibling's door that can be opened and locked by the sibling, but not by the child with ADHD. Sometimes parents resist such an approach because they feel they do not want their home to feel like a prison. However, this may be preferable to a home that feels like a battlefield!

A child with ADHD who cannot resist taking chocolate bars from the kitchen cupboard because of his insatiability and poor impulse control may be controlled by the installation of childproof locks, or by hiding the chocolates. Sometimes parents are so close to the problem, and under so much stress, that they find it difficult to stand back and think of these practical solutions.

Many children with ADHD demonstrate several unwanted behaviours. You will need to decide which of these you want to tackle first. It is usually possible to tackle only one behaviour at a time successfully. Sometimes the choice is easy; the most worrying

behaviour may be the most amenable to change. Sometimes behaviours are related and eradicating one may get rid of others. If you are feeling overwhelmed by more than one behaviour problems, it may be more rewarding to tackle a relatively minor problem first. Your quick success may then encourage you to tackle the bigger problems.

Do not ignore your own stress. It is very difficult to manage a child's behaviour when you are at breaking point. Children with ADHD do not obey reasonable rules, which can be extremely stressful to parents; the behaviour of a difficult child can create tremendous stress in a family and can drive parents apart. Both parents need a chance to express their feelings about the child. There are times when you need to get away and have a break. It may be a matter of having your child minded while you go for a walk, listen to music, or soak in a warm bath.

The basis of many of the undesirable behaviours in children with ADHD is poor self-esteem. Often children behave poorly at home because of negative experiences at school with their peers or a teacher. If these antecedents are understood, much can be done to decrease behaviours by building up the child's self-esteem (see Chapter 12).

Some children's behaviour deteriorates as they become tired at the end of the day, and this may also need to be taken into consideration. Some children may have behaviour difficulties because their medicine is not covering the entire waking period. Sometimes children's behaviour may become worse as the medicine wears off, an effect known as *rebound*. For this reason, difficulties in a child's behaviour should always be discussed with your child's paediatrician.

In many children, the onset of puberty is associated with worsening of behaviour. Although puberty is a time when the brain may mature and the ADHD resolve, for some this does not happen, and the only effect of puberty is the worsening of behaviour because of the effect of hormones on the brain. Parents often do not realize that the hormonal changes associated with puberty start some two to three years before the physical changes are seen in the body. Knowing that the behaviours are due to the hormonal effects of puberty may make them bearable. In most children, this difficult phase will usually pass when the initial rapid changes of puberty are over.

Many parents find it difficult to plan and implement a behaviour management programme on their own. If, after trying the methods described in this chapter, you have not succeeded, do not hesitate to

consult your doctor and ask for a referral to a psychologist. A psychologist will spend time finding out about the child's behaviour as well as about the home situation. Together, you and the psychologist can plan what you need to do to modify the behaviour. The psychologist will stay in contact with you and provide advice if further problems arise.

Reading a book that provides parents with advice on managing a children's behaviour can also be helpful. Dr. Thomas W. Phelan's *1-2-3 Magic* provides effective strategies for managing the behaviour of children 2–12 years of age. It is appropriate for children with ADHD.

# 15

# Medicines—general principles

## Key points

- All the medicines used to treat ADHD aim to normalize the amount of neurotransmitter in the frontal lobes of the brain.
- The medicine for a particular child with ADHD needs to be selected with care and based on several considerations.
- Medicine has the potential to reduce many of the difficulties experienced by children with ADHD. In many children, the change is dramatic.
- Some children with mild ADHD can manage to overcome their difficulties without taking medication.

As explained in Chapter 10, evidence from many sources points to low levels of neurotransmitters in the frontal part of the brain as the cause of ADHD. Based on this evidence, the ideal treatment for ADHD would be a medicine that increased the amount of these neurotransmitters to levels appropriate for the child's age. Fortunately, several such medicines exist.

In every child with ADHD, consideration should be given to the use of one of these medicines as part of the treatment. Ideally, such a medicine would be administered to the child from an early age, before problems with poor self-esteem, social difficulties, academic failure, and family stress have caused irreversible harm. In a child who is receiving an appropriate medicine, all other forms of treatment, such as educational and psychological intervention, will be more effective.

These medicines help the child's brain to function like the brains of other, normal children; they do not sedate the child. Most, but not all, children will be helped by medication.

While the effects of these medicines last only as long as the medicine remains in the child's body, any skills the child has learned will persist. This means that children who are treated with medication have better

academic outcomes and fewer long-term behavioural and emotional complications from their ADHD than those who are not. In addition, new research that suggests that individuals with ADHD who are treated with medication during childhood may be more likely to grow out of their condition during late puberty than those who are not.

## How the medicines work

All the medicines used to treat ADHD increase the amount of one or both of the neurotransmitters: dopamine and norepinephrine. Each acts on one or more of the steps involved in the synthesis, release, reuptake, breakdown, and autoregulation of these neurotransmitters at the *synapse* (nerve ending). Figure 15.1 is a schematic representation of these steps (described in Chapter 10).

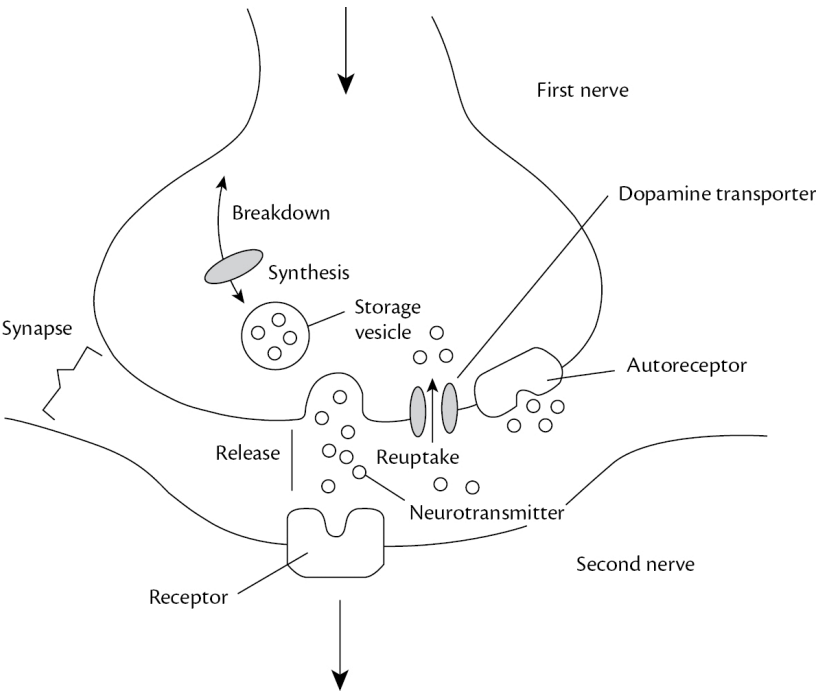


**Fig. 15.1** The pathway of neurotransmitter release, reuptake, and breakdown at the synapse. The autoreceptor (responsible for feedback) and the dopamine transporter (responsible for reuptake) are also shown.

Research in biochemical pharmacology—the study of how medicines change the chemistry of the body–has revealed precisely where each medicine acts in the brain. For example, because the action of *Ritalin* (methylphenidate) is blocked by the drug reserpine, while that of dexamphetamine is not, differences between the action of Ritalin and dexamphetamine can be studied. Reserpine depletes dopamine and norepinephrine from storage vesicles, indicating that one of the ways that Ritalin acts is by releasing these neurotransmitters from the storage vesicles.

Some medicines used in ADHD are also used for other conditions, but treatment of ADHD requires smaller doses. These medicines have different effects on the neurotransmitter pathway in different doses. For example, low doses of Tofranil (imipramine) are used to treat ADHD; it increases the amount of norepinephrine in the synapse by reducing its reuptake by the nerve cell. The same medicine is used in larger doses to treat depression, where its action on the reuptake of another neurotransmitter, serotonin, is responsible for its antidepressant effect.

Some children with ADHD are helped by only one particular medicine. Other children are helped by a number of medicines. These individual responses depend on which part of the neurotransmitter pathway is affected.

The action of a medication used to treat a child does not have to correct the precise defect in dopamine metabolism in that child; its effect can be less specific. For example, a child who has a genetic defect that makes her dopamine receptors abnormal and less responsive to dopamine may be helped by any medicine that increases the amount of dopamine. The increased levels of dopamine would flood the receptor to such a degree that it would respond. It is for this reason that the particular medication that the child responds to cannot be used to determine her precise genetic defect.

Current research will help us better understand the links between specific defects in neurotransmitter metabolism and response to particular medications. For example, children who inherit two copies of the ten-repeat variant of the *DAT1* gene respond poorly to the medication Ritalin. Ritalin acts by binding on to the dopamine transporter and, if this is grossly abnormal, as it is in these children, Ritalin will not be able to work.

All these medicines play their role by enabling the child to have normal (or near-normal) levels of neurotransmitter, until such time as her nerve cells are capable of producing adequate levels on their own.

## How do we know which is the right medicine for a particular child?

The medicine for a particular child needs to be selected with care, based on a number of considerations.

1. First, there is the pattern of difficulties experienced by the child. Children with comorbid oppositional behaviour, for example, usually benefit from clonidine or guanfacine. Children with comorbid depression usually benefit from imipramine.
2. Second, there may be reasons to avoid (contraindications to) certain medicines. For example, imipramine should be avoided in a child with an irregularity in her heartbeat.

After addressing these aspects, the doctor can choose a suitable medicine and test the child's response to it. This may involve a computerized test before and after the medicine, as well as monitoring by parents and teachers.

## Which aspects of ADHD do the medicines help?

Few groups of medicine have been subjected to as much research as those used in ADHD. The majority of the studies have focused on Ritalin, but there have been many evaluations of the other medicines in the group as well.

This research has measured a number of treatment outcomes. It has involved objective measurements of children's performance, as well as the subjective ratings by parents, teachers, and peers. The studies have shown that, when children with ADHD take an appropriate medicine, the improvement is wide ranging and positively affects learning, behaviour, social skills, and emotional state.

### Learning

A large number of studies have found that medicine enhances performance on measures of vigilance, fine motor coordination, impulsivity, and reaction time. Positive effects have also been obtained on measures of learning and memory, for both non-verbal and verbal material.

Studies have shown that children become better at simple and complex learning procedures. They are better able to remember words and symbols they have learned. They can recall information they have learned more rapidly and more accurately.

Studies have also shown that medicine can improve academic productivity and accuracy in children with ADHD. Handwriting becomes neater and task persistence improves.

None of the learning that occurs in children on medicine is 'state dependent'. This means that skills and knowledge acquired while a child is on medicine do not wear off when the medicine is no longer taken.

There is a common misconception that Ritalin saps a child's creative thinking. Funk and Chessare were the first researchers to show that Ritalin does not adversely influence creative thinking.

## Behaviour

Medicine also results in dramatic positive effects on behaviour. There is improvement in concentration on assigned tasks. Children on medicine are more settled and less overactive. They become less impulsive and disruptive. They become more compliant. Aggression is markedly reduced.

A common fear is that the use of medicine will make the child overly compliant and take away her natural exuberance and sparkle. This is not the case. While children with ADHD do become better able to conform to reasonable rules when taking medicine, they nevertheless remain slightly more active and impulsive than their peers. Medicine correctly used does not transform them into unresponsive automatons.

## Social skills

Medicine also helps children with their social interactions. There is a reduction in negative behaviour, and children become less defiant. Interactions with peers improve greatly. Children are less likely to behave in a silly, immature, and overexcited manner. In one study, peers consistently rated children with ADHD as being more fun when they were on their medicine. This observation was made without the peers knowing when the children with ADHD were on their medicine.

## Emotional state

The medicines also have an effect on children's mood. Children generally become more positive about themselves and more confident in day-to-day activities. Parents report that their children become more reasonable and that outbursts of anger decrease in frequency and intensity.

Many parents have observed that their child became more outgoing and more communicative on medication.

### Long-term effects

As discussed in Chapter 16, it has been found that treating children with ADHD with stimulant medication results in an 80% reduction in the risk of substance abuse.

In addition, research using a special type of scan (*diffusion tensor MRI*) shows that treating children with ADHD with stimulant medication is associated with better preservation of the white matter of the brain, which is the area containing vital nerve tracts. If there is depletion of neurotransmitter at a synapse, as occurs in ADHD, the nerve cell (*neuron*) beyond the synapse fails to fire. A neuron that does not fire will eventually wither and die. This is the way the body works: use it or lose it! This means that even if neurotransmitter levels eventually rise with brain maturity, there will be fewer neurons able to respond to the neurotransmitter. By increasing neurotransmitter levels at the synapse, treatment with medication preserves neurons, giving the individual with ADHD a better chance of growing out of her difficulties.

## The place of medicine in the treatment of ADHD

Medicine has the potential to reduce many of the difficulties experienced by children with ADHD. In many children, the change is dramatic. It is not unusual for the change in the child to be described as miraculous. Often the child seems to be completely transformed when on treatment. This is because the child is able to behave in a more mature, age-appropriate manner.

For some children, medicine may so improve their competence that no other form of special treatment is needed. Ordinary educational programmes and average parental rearing practices are sufficient for their needs. For other children, medicine alone is not enough and must be used in conjunction with individualized educational and behaviour management programmes.

Not every child will respond to these medicines; some 5% of children are not helped by any of the medicines currently available.

The decision about whether a child should take medication should be made by the parents on the advice of their child's paediatrician. This should follow a comprehensive assessment (see Chapter 11). Whenever possible, the child should be involved in the decision as well.

## Can children with ADHD be treated adequately without medication?

Some children with mild ADHD can manage to overcome their difficulties with non-medical intervention. However, for children with moderate or severe ADHD, behaviour management and educational strategies are generally inadequate when used alone. Why is this the case?

Behaviour modification is based on rewarding desirable behaviour and ignoring undesirable behaviour. This is often impractical in children with ADHD, because desirable behaviour is too infrequently displayed to allow reinforcement. Undesirable behaviour, on the other hand, may be so disruptive or dangerous that it cannot be ignored.

The memory and attention of many children with ADHD are so impaired that they do not benefit adequately from educational programmes, without the help of medication.

Another problem with non-medical treatments for ADHD is that, in situations where parents and teachers are not able to be present, the child may fail miserably. For example, in her social interactions (when adults cannot play a role) the child with ADHD may have a great deal of trouble because of her poor social cognition. This is often compounded by peers responding in a way that is detrimental to the child.

When she needs to occupy herself, or organize her work independently, the child with ADHD often becomes dysfunctional because she lacks the necessary self-direction and self-organization skills. In these situations, the child with ADHD may enter a vicious cycle. She fails because of her difficulties and then does not want to try again because she fears further failure.

Medication offers the child with ADHD the opportunity to escape this vicious cycle and enter a ‘virtuous cycle’. Because the child becomes more competent when taking the medicine, other forms of treatment, such as behaviour modification and education programmes, become more effective. With the medicine playing its role, there is a reduction in undesirable behaviour. The child can, therefore, receive more appropriate praise. She also becomes more attentive during class and remedial work, and her learning improves.

As the child becomes more successful, both at home and in school, she is prepared to attempt new tasks and to face new challenges. As she succeeds in these, her learning and behaviour improve. It is not

surprising, therefore, that children with ADHD often surge ahead, once on medicine.

Studies such as the huge MTA (Multi-modal Treatment of ADHD) trial, carried out by the National Institute of Mental Health in the USA, have demonstrated that the best results are obtained by combining medicine with other strategies, known as the *multi-modal* approach.

## Explaining the role of medicine to your child

For the best results, it is essential that your child understands the role of the medicine.

First, emphasize to your child that she *is* able to concentrate, but that this requires a great deal of effort on her part. It is essential that she realizes that she *does* have the ability to concentrate, and that she does not feel that the medicine will be used because she is unable to do this at all. Explain that the role of the medicine is to make it *easier* for her to concentrate.

The analogy of wearing glasses is useful. Explain that in the same way that some children wear glasses to make seeing easier, some children need medicine to make concentrating easier. Emphasize that in the same way that glasses do not dictate what the wearer should look at, so the medicine will not control what she concentrates on. She will still have to decide what she wants to concentrate on; the medicine will allow her to do this more effectively, with greater ease, and for longer periods of time.

Also explain that wearing glasses doesn't make someone instantly smarter. Similarly, the tablets contain no knowledge; they will only help her to learn more effectively. She will still need to complete her work and to commit it to memory. The medicine is only tool.

A child with ADHD embarking on treatment with medicine needs to know that her progress will be carefully monitored and that she will be given a guide as to how she is progressing. She also needs to know that the time will come when she will no longer require the medicine and that she can then stop taking it.

Most children are only too happy to have this kind of help. Some may, however, not want other children to know that they are taking medicine. Peers may say inappropriate things, and children with ADHD do not want to be teased about having to take tablets to help them. The dose that usually gives problems in this regard is the one that is taken during school hours.

If possible, doses at school should be avoided. The new long-acting preparations discussed in the Chapter 16 have been helpful in this regard. If these are not suitable, and the child must take medication at school, it should be taken in private. For the older, more competent child, it is best if the tablet is packed with her lunch, so that she can take it during her break.

It is essential that all concerned—parents, teachers, and siblings—do not say things such as, 'You are behaving badly—go and take your medicine!'. The taking of medicine should be a routine event, like brushing teeth; it should not attract comment.

With the intensive anti-drug campaigns directed towards children, it is not surprising that many are against the idea of regular medication. Explain that there is a great difference between illegal drugs and a medicine prescribed by a doctor. It is not drug abuse to take a medicine prescribed for a condition by a specialist who has made a specific diagnosis and who will monitor the child's progress.

# 16

# A guide to specific medicines

## Key points

- There are many different medications used for ADHD, and these should only be prescribed by a medical specialist experienced in this field.
- Many children with ADHD do not need to take their medication every day of the week.
- The availability of long-acting medication means that most children with ADHD do not need to take medication at school.

The medicines used in ADHD are a heterogeneous group. Their main common attribute is that they all increase neurotransmitter levels at the synapse. Few of these medicines are used exclusively for treating ADHD. Among them are medicines also used for disorders as diverse as narcolepsy (a condition characterized by excessive daytime sleepiness), eating disorder, bed-wetting, high blood pressure, migraines, and depression. They are generally prescribed in smaller doses for ADHD than for these other disorders.

The vast majority of children with ADHD are treated effectively with a single stimulant medicine. Stimulant medications are described first and are divided into short-acting stimulant medications and long-acting stimulant medications. Since short- and long-acting stimulant medications contain the same active ingredients, they share many properties, and therefore a great deal of the information on short-acting stimulants will be relevant to long-acting stimulant medications as well. Non-stimulant medications are described at the end of the chapter.

Not all medicines mentioned in this chapter are available in every English-speaking country. New medicines are regularly registered in each country and you will need to check with your child's doctor about the availability of any particular medicine.

## Stimulant medications

### Short-acting stimulant medications

The short-acting stimulant medications are Ritalin, Focalin, dexamphetamine,[1] and Adderall IR (immediate release). They all come in tablet form.

Dexamphetamine was first used for children with ADHD in 1937, when Dr Charles Bradley serendipitously discovered that it helped children who had difficulties with sustained concentration. Ritalin has been used for the same purpose since 1957, Focalin since 2001, and Adderall since 1996.

These medications do not accumulate in the body. They enter the body, work for a few hours, and are then deactivated in the liver. The inactive end-products are excreted in the urine and, to a lesser extent, in the faeces.

These medicines are called *stimulants* because in a normal person they increase neurotransmitter levels above normal, resulting in overstimulation and overactivity. In a person with ADHD however, they have the paradoxical effect of making the individual less restless and more focused. This is because neurotransmitter levels are only increased to normal, or near-normal, levels.

Although Ritalin, Focalin, dexamphetamine, and Adderall IR are all related, they are not identical and have different effects on the neurotransmitter pathway. It is for this reason that some children respond better to one than another. Medicine testing, described in Chapter 15, is therefore of great importance.

### Ritalin and Focalin

Each of these two short-acting stimulant medications contain a single active ingredient: methylphenidate hydrochloride. Ritalin consists of a mixture of equal quantities of two different forms of the methylphenidate molecule. Such a mixture is known as *racemic*. These two forms, known as *isomers*, are mirror images of each another. They can be compared with the two forms of the human hand: the right and the left. The two hands are analogous, but differently oriented in space. The right-handed molecules of methylphenidate are the *dextro isomer* (*dextro* is the Greek word for right) and the left-handed molecules are the *levo isomer* (*levo* is the Greek word for left). Only the dextro isomer has therapeutic properties. The levo isomer has no therapeutic effect. It is for this

reason that a pure dextro isomer has been manufactured and marketed. This is the active ingredient in Focalin.

It was thought that excluding the inactive levo isomer would make Focalin less likely to cause side effects. This was based on the belief that the levo isomer, while not having any therapeutic effect, did have the same side effects as the dextro isomer. The evidence for this however, is not convincing. Focalin shares the same duration of action and side effects as Ritalin. Since all the methylphenidate in a Focalin tablet is therapeutically active, only half the amount of methylphenidate by weight has to be given. For example, 5 mg of Focalin is equivalent to 10 mg of Ritalin in its therapeutic potency.

## Dexamphetamine and Adderall IR

In dexamphetamine, the active ingredient is dexamphetamine sulphate. When we refer to *dexamphetamine tablets* we mean tablets containing this single salt. Dexamphetamine contains the pure dextro isomer of amphetamine, as the prefix 'dex' indicates. This is the reason why only 5 mg of dexamphetamine is of equivalent potency to 10 mg of racemic Ritalin.

Adderall IR tablets contain a mixture of dexamphetamine sulphate together with a different salt of dexamphetamine, as well as two salts of amphetamine. The four salts in an Adderall IR tablet are: dexamphetamine sulphate, dexamphetamine saccharate, amphetamine aspartate monohydrate, and amphetamine sulphate. Each one of these four salts makes up a quarter of the active ingredients. Adderall IR may be preferable to pure dexamphetamine sulphate in some children because of its slightly longer duration of action.

## Duration of action

Ritalin, Focalin, dexamphetamine, and Adderall IR take effect 30 minutes to one hour after administration. The effect of Ritalin and Focalin lasts for approximately four hours. Dexamphetamine has a slightly longer duration of action than Ritalin and Focalin, but this is not noticeable in most children. Adderall IR acts for approximately five hours in most children.

These durations of action are only approximations. In some children, the effect of these medicines lasts for only three hours, while in others it continues for six hours. This depends on the rapidity with which the child's body metabolizes (breaks down) the medicine in the liver, and

on how quickly the neurotransmitter levels, once raised by the medicine, are broken down in the brain.

**Administration**

Ritalin, dexamphetamine, and Adderall IR all come in the form of scored tablets that can be cut into halves. It is possible (but not easy) to cut each half into quarters. Focalin tablets are not scored but do come in half strength. A 10 mg dose of Ritalin is equivalent in potency to a 5 mg dose of Focalin, dexamphetamine, or Adderall IR.

Some children are very sensitive to these medicines and require only a half or a quarter tablet for each dose. Other children, of exactly the same body size, require one-and-a-half or two tablets for each dose.

The appropriate dose does not depend on the child's weight and age alone. It is determined by the type of difficulties the child has, his temperament, constitution, and the speed with which his body breaks down the medicine. For example, a child who is dreamy and vague usually needs a relatively small dose to help his concentration and working memory. If such a child is given a larger dose, his performance may deteriorate. Children who are overactive or aggressive usually need larger doses.

Children who are delicate and anxious tolerate only small doses; robust children generally respond best to higher doses. The choice of the best dose to suit a child is as much an art as a science and requires the prescribing doctor to have a great deal of experience in treating children with ADHD.

In all cases, it is best to start with a small dose and then slowly to increase the dose after five or six days; this enables the child to adjust gradually to the effects of the medicine. 'Start low and go slow' should be the guiding principle.

These medicines do not accumulate in the body, and every child will have periods during the day, as well as during the entire night, when the medicine is absent from the body. This means that when the medicine needs to be stopped, there is no need to withdraw it slowly; the child can abruptly stop taking it.

It is best for children to take any of these medications after food whenever possible because they tend to decrease appetite when they are present in the body. In addition, the medicine is more likely to cause abdominal discomfort if taken on an empty stomach. These medicines are all well absorbed with food, but it should be noted that acidic foods (including vitamin C supplements) decrease the

absorption of dexamphetamine and Adderall IR, reducing their effectiveness. This is not the case with Ritalin or Focalin.

For most children, the first tablet is given after breakfast, at approximately 7.30 a.m., and the second tablet is given at recess at approximately 11.00 a.m. This second tablet starts working at approximately 12.00 noon, which is when the first dose of the day has worn off. Children who take Adderall IR, which acts for slightly longer, may not require a tablet at school.

Many children on these medicines require another dose to help with the afternoon period at home. This is important in helping the child with his homework, and also with his behaviour at home. It is best if this dose is given at approximately 3.30 p.m., when the child arrives home. It should not be given later than 4.00 p.m. or it may interfere with the child's ability to fall asleep at night. Stimulant medications make children more alert, and this may cause insomnia. This problem is more likely to occur with an afternoon dose of Adderall IR than with an afternoon dose of Ritalin, Focalin, or dexamphetamine, due to Adderall IR's longer duration of action.

It is often best to give a smaller amount of medicine for the third dose than for the earlier doses of the day. This has the advantage of making it easier for the child to fall asleep at night, and also prevents a phenomenon known as *rebound*, which may occur when the medicine abruptly wears off. Rebound manifests itself by the child becoming restless or moody for a short time as the medicine suddenly stops working. The moodiness may take the form of angry outbursts or tearfulness. By giving a half-dose for the last part of the day, the effect of the medicine subsides more gradually, and rebound does not occur.

Some children have trouble falling asleep if they are given more than two doses per day. Children on only two doses per day may benefit from taking the first at approximately 8.00 a.m. and the second at approximately 12.00 noon. With this timing there is better coverage throughout the day.

There is an exception to giving the first dose after breakfast. This occurs when a child with ADHD finds the early morning, immediately after rising, exceptionally difficult. Such a child may be emotionally changeable and impulsive to such a degree that he is unable to carry out the necessary morning tasks before breakfast. For such a child, a small dose of a short-acting stimulant given the moment he wakes in the morning can make a big difference to his ability to manage. If possible, the child should then be given an early breakfast. He may take the usual morning dose immediately before leaving for school.

An occasional child metabolizes the medicine extremely quickly and, if a long-acting form cannot be given, may require four or even five doses spread out through the day.

## Long-term safety

The short-term safety of a medication is established by trials carried out prior to the granting of approval to market the medication. This is a prerequisite required by all national drug-registering bodies. Long-term safety, however, is not established in this way.

Many lay people have an erroneous concept about how the long-term safety of a medication is established once it has been marketed. They often believe that, after a long period of time, a large group of people who have taken a medicine is subjected to every conceivable test to establish whether they have any signs of ill-health attributable to the medicine. This is not the case.

To detect long-term side effects, we rely on treating doctors to notice and report any unusual health problems in their patients that may be attributable to a medicine they have taken (this is known as *post-marketing surveillance*). It is only when a suspicion about a particular long-term side effect exists that testing for that side effect will happen as a research project. For this reason, the long-term safety of a medicine can best be established if a medicine has the following characteristics:

- It has been used for a long time.
- Many individuals have taken it for extended periods of time.
- It has a high public profile (i.e. it is not likely to be overlooked).
- Individuals who take it are regularly examined by a doctor.

It is difficult to think of medicines that fulfil these criteria more completely than Ritalin, Focalin, dexamphetamine, and Adderall IR. Methylphenidate has been used for 64 years, dexamphetamine for 84 years, and Adderall IR for 24 years. Millions of children have taken them, they are usually taken for several years, they have always had high media profiles, and individuals who have taken them have invariably been examined regularly by a specialist. In fact, Ritalin is arguably the single best-studied medicine used in paediatrics.

The only long-term side effect of stimulant medication for ADHD that has been reported was growth suppression, which was first noted in the 1970s. Later studies showed that this was a dose-related phenomenon—associated with higher doses—probably due to a decrease in appetite. It is a transient effect that occurs primarily in the

first year of treatment and seems to have no effect on eventual adult height. Nevertheless, the growth of children receiving these medicines should be monitored regularly by their paediatrician.

There have been no other long-term side effects reported when stimulant medications have been used appropriately to treat ADHD.

## Short-term side effects

Short-term side effects occur at the time that the medicine is present in the body, or just as it wears off (rebound). These are all *potential* side effects; they do not occur in most children. In the case of stimulant medication used appropriately, each side effect is always reversible, and none is life-threatening. When they occur, they tend to be at their most severe when treatment first starts and decrease or disappear after the first couple of weeks of treatment. These side effects (discussed next) are often avoided by starting treatment with a small dose and gradually increasing to the desired dose after a few days.

### Decreased appetite

During the time that each tablet is present in the body, appetite may decrease. To prevent this side effect spoiling the child's appetite for breakfast, the first tablet of the day is usually taken after breakfast has been eaten. Most children on these medicines eat slightly less during the day, a time when many schoolchildren do not eat much in any case. Many children compensate for this by eating more at the end of the day when the effect of the medicine has worn off.

When treatment with these medicines begins, there is often a slight loss of weight over the first couple of months. In the vast majority of children, weight stabilizes and then starts increasing again.

For many children with ADHD who are overweight, this slight drop in weight is beneficial for their self-image. It is unusual for weight loss to necessitate the withdrawal of medicine. Occasionally, a reduction in dose may be necessary because of weight loss.

### Insomnia

The second common side effect is difficulty falling asleep at night. This occurs most frequently when treatment first begins; it usually resolves after one or two weeks. If insomnia persists, the last dose of the day may be reduced or omitted. Some children are very sensitive to this effect and can only tolerate a morning dose.

### Headaches and abdominal pain

An occasional child suffers from headaches or abdominal discomfort when treatment begins. These side effects usually disappear after a few days.

### Mood changes

If a child is given an excessive dose of a stimulant medicine, he may become too focused (overfocused). He may become too quiet and subdued and lose his natural sparkle while the medicine is working. Such a child may become tearful and seem depressed when the medicine is in his body.

These responses suggest that the dose of medicine is too high for the child and should be reduced. In this situation, the dose should be lowered; a child's natural exuberance should always be maintained while he is on treatment. Some children will need to have the dosage reduced by only half a tablet or less for these side effects to resolve. The tablets are scored down the middle, but can be broken into quarters, or even eighths, with a pill cutter or sharp knife. Parents should experiment with slight reductions to the dose in order to achieve the best result. They should not hesitate to contact their child's doctor if the dose does not seem to be appropriate.

### Rebound

Some children might become overactive, irritable, or tearful when the effects of a tablet wear off—this is rebound, and is short lasting. Some children will cope with this by becoming involved in a physical activity.

Parents who realize that their child is regularly having this reaction for a short period of time may encourage him to go outside and play, or to sit quietly and watch television. During such periods, it is important not to make excessive demands on the child. Often a half dosage of the medicine given on return from school corrects afternoon rebound.

Since stimulant medications can suppress appetite, changes in mood that are due to eating too little need to be distinguished from rebound.

## Special situations

### Children with heart disease

Children with heart disease should not be given stimulant medication unless their cardiologist considers this to be safe. Most children with heart defects will be allowed to take a stimulant medication by their cardiologist but may require closer monitoring.

### Children with tics

Children who tend to motor or vocal tics (see Chapter 4) may have their tics exacerbated by stimulant medications. This is not always the case, and tics are often unaffected, or may even improve. Nevertheless, a child with tics should be monitored when taking stimulant medication and these medicines should be stopped if tics worsen. Other medicines for ADHD may then be used, such as clonidine, which has the advantage of reducing tics.

### Children with epilepsy

At one stage it was thought that children with epilepsy should not be given stimulant medicines. It is now realized that only in rare cases are seizures aggravated by stimulant medication and these medicines can be given to most children with epilepsy.

## Do stimulant medications cause drug addiction?

Definitely not. In fact, these medicines have an important advantage of protecting children with ADHD from addiction to a wide range of dependence-producing substances. Unfortunately, children with ADHD are at higher risk of substance abuse than other children because of their condition. Taking stimulant medication reduces this risk to that of the normal population.

In 1999, researchers from Boston demonstrated that when children with ADHD had taken Ritalin regularly during childhood, their risk of substance abuse (to any substance) was 85% less than for children with ADHD who had not taken Ritalin (Figure 16.1). The same researchers later reported the results of their analysis of six large studies involving 1,034 individuals with ADHD. This also demonstrated the protective value of stimulant medicines against later substance abuse.

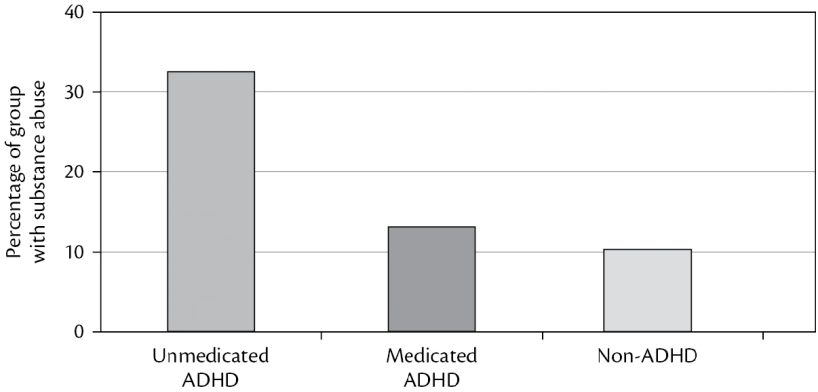


**Fig. 16.1** Treatment with Ritalin reduces substance abuse in ADHD. Based on data from: Biederman, J., Wilens, T., Mick, E., Spencer, T., and Faraone, S.V. (1999) Pharmacotherapy of attention-deficit/hyperactivity disorder reduces risk for substance use disorder. *Pediatrics,* **104**(2): 20–28.

Provisional data suggest that the earlier Ritalin is started in these children, the lower the risk of substance abuse.

The idea that we can 'fight drugs with drugs' is still too challenging to be promoted by the media. This important message is, therefore, not being disseminated. If it were widely known, substance abuse in the adult population might be considerably reduced.

The concern about addiction was initially raised because dexamphetamine is a member of the amphetamine family (Ritalin and Focalin, however, are not—methylphenidate comes from a different family of medicines known as the piperidines). It must be emphasized that there is no risk of a child with ADHD becoming addicted to stimulant medication when it is used properly.

When amphetamines cause addiction, they do so by giving the person a 'hit' or 'high' when sniffed or injected. This is due to the almost instantaneous burst of amphetamine delivered to the brain when absorbed in concentrated amounts through these routes. No such burst occurs when stimulant medication is taken orally in therapeutic doses. These children do not experience a 'hit' or a 'high'. The rate of increase in dopamine generated when these medicines are taken orally is too slow to do this.

Most parents of teenagers with ADHD on stimulant medication find that it is difficult to get their child to remember to take their tablets. They certainly do not ask for them or derive any pleasure from taking them.

## Should stimulant medications be taken on weekends?

Children whose only difficulty relates to schoolwork need only to take their medicine on school days.

An occasional child with school-based difficulties may find that he has problems falling asleep on Monday nights, because his body has to adjust to the reintroduction of the medicine after each weekend break. In such a case, it may be better for the child to take the medicine seven days a week.

Children who have difficulties at home and at school should be given the benefit of medicine seven days a week. For such children, their condition, and the difficulties they face, are present seven days a week and there is no reason to withhold treatment on weekends. Taking the medicine continuously allows the behaviour of such children to be far more consistent and they consequently have greater opportunities to learn and succeed throughout the week.

For most children who take medicine on weekends, the dosage regime can be more flexible on Saturdays and Sundays than on other days of the week. For example, a child who takes medicine at 7.30 a.m., 11.00 a.m., and 3.30 p.m. on weekdays (three doses), may find it easier to take the medicine after a late breakfast and after lunch (two doses only) on Saturdays and Sundays.

If a child plays sport on weekends, the medicine might be given one hour before a game. This allows the child to be more focused during the game, and therefore more successful. This is discussed in more detail in the next section.

A child who has remedial lessons on weekends can have his dose timed so that he takes a short-acting tablet one hour before the lesson. This will enable him to concentrate and persist with tasks more effectively during the lessons.

During school holidays, a child who has difficulties with behaviour should be kept on his medicine unless there is a special reason to stop it, such as the need to gain weight.

## Stimulant medication and sport

The effect of stimulant medication on the sporting performance of children with ADHD depends on the type of sport the child plays.

Stimulant medications improve concentration and so improve performance in sports that require intense concentration, such as baseball, cricket, and tennis. Medication may make a child with ADHD

who is dreamy and uninvolved in team sports much more alert and part of the game.

The medication may also be very helpful for children who cannot cooperate in coaching sessions because of their poor concentration, restlessness, and impulsive behaviour.

In some contact sports, however, where aggression and impulsivity are valued (such as some football codes), these medicines may make a child too thoughtful and cautious, thereby impairing performance.

A child with ADHD whose condition undermines his ability to play sport may be tried on medication prior to an event to see if it improves or impairs his sporting performance. Children with ADHD who do not experience difficulties in sport should not take medication for sport.

Parents of children with ADHD who play sport at a high level should be aware that stimulant medicines are detected on random drug screening and are regarded as performance-enhancing drugs. It is usually permissible for these medicines to be present in the body *prior* to a sporting event, but not during an event. They differ in this way from some other performance-enhancing drugs, such as steroids, because the effect is not to build up muscles or stamina over time, but only to improve concentration at the time that they are present in the body.

If a child with ADHD plays sport at a high level, it is advisable to seek written permission from the sport's governing body prior to participation. The child's doctor will need to provide a letter outlining the rationale for administering the medication and emphasizing that it is being used to correct a disability, rather than to enhance the performance of a normal child. Many sporting bodies have application forms for such therapeutic use exemptions.

## Travelling overseas with stimulant medication

Importation of the stimulant medications used to treat ADHD is strictly controlled in most countries. If you intend travelling overseas and need to take your child's medication with you, seek prior information about the customs regulations in each country through which you will travel.

In most cases, a letter from your child's doctor will suffice. More information may be required, particularly in those countries with significant drug-trafficking problems. Always keep a separate second copy of any documentation you receive from your doctor. A copy of the original prescription may also be helpful.

Take only the amount of medication required for the trip. Keep the tablets in their original package with the pharmacist's label stating the

name of the child and the daily dosage.

## When to stop treatment

The decision about whether to stop the medicine should be reviewed every six months. Many children will continue to need their treatment until they reach the age of 16–18 years. This means that many children will need to take the medicine for several years.

## Long-acting stimulant medications

The standard Ritalin, Focalin, dexamphetamine, and Adderall IR tablets are *immediate-release* or *short-acting* forms of the medicine. A longer-lasting duration of action is often desirable, and for this reason long-acting forms of these active ingredients have been developed. All these long-acting medications deliver the same active ingredients that are present in one of the short-acting medications described earlier. They are manufactured in such a way that the active ingredient is slowly released form the tablet or capsule once it has been swallowed. The potential side effects are therefore the same but, if they occur, last longer.

### The advantages of long-acting stimulant preparations

The child who takes a long-acting capsule in the morning does not have to take another dose at school. This is convenient for the child and for the school staff. It is useful for children who are forgetful, and for those who are embarrassed about other children knowing that they have ADHD. Concern about the adverse comments of other children is the main reason that children with ADHD do not comply with taking their medication. If other children are unaware that the child has ADHD, this prevents teasing.

Long-acting medication avoids the need for the child to miss play or lesson time in order to go to the school office or nurse's station to take the medication.

Another advantage is that a child who takes long-acting medication is not frequently reminded of his condition by the need to take tablets during the day. He is, therefore, less likely to feel that he is different to other children. This has a positive effect on the child's self-esteem.

When long-acting medication is taken, tablets do not have to be kept on the school premises, reducing the chance of the medication getting into the wrong hands. This also reduces the chance of children without ADHD taking medication accidentally or abusing it. It also puts an end to the trade in tablets that occurs in some schools. A number of long-

acting forms are made in such a way that the medication cannot be extracted from the capsule and injected (mainlined) or sniffed (snorted), preventing abuse.

Long-acting forms of the medication also enable the child's teacher to monitor the effects of the medication without knowing on which days the medication has been administered (blind trial). This is the most objective way to evaluate the usefulness of the medicine in a child. As the medicine is not taken at school, it is easier for the teacher not to be involved with, or aware of, which days it has been taken.

Long-acting preparations can be helpful for children who are rapid metabolizers of methylphenidate or dexamphetamine. In some children, the effect of an immediate-release tablet wears off earlier than the usual lower limit of four hours. The body of such a child is highly efficient at breaking down (metabolizing) the medicine into inactive end-products.

Long-acting stimulant medication has a smoother action, with the result that children who experience mood swings on short-acting stimulant medication often benefit from a switch to longer acting forms.

**When not to use long-acting stimulant preparations**

In young children who are taking the medication to reduce poor concentration in the classroom, a long duration of action is often unnecessary, because at this level of schooling most of the academic work is confined to the morning. Teachers usually do not expect young children to be able to concentrate on academic work after midday. The use of a long-acting preparation in such a child may decrease their appetite for longer than is necessary and a single immediate-release tablet before school may be preferable.

Some children are very sensitive to the medication's adverse effect on sleep and/or appetite, and it may be best to opt for a shorter duration of action to enable the child to eat between doses and to ensure that the effect of the medicine has worn off by the evening mealtime and by bedtime.

It is not advisable to start a child on a long-acting preparation when the medicine is taken for the first time. First, it is important to ensure that a longer duration of action is really necessary by experimenting with the short-acting form by adding doses sequentially through the day if required. Second, as any potential adverse effect of the medication is likely to be more marked when the medication is first introduced, it is better that such a problem be as short-lived as possible. It is, therefore, best to start a child on the short-acting form

and to only change to a long-acting form once the child's response to the medication and the optimal daily dose have been determined.

Swallowing tablets can be difficult. The short-acting stimulants (Ritalin, dexamphetamine, and Adderall IR) can all be chewed or dissolved in fluid before swallowing. This is not the case for Concerta, a commonly used form of long-acting methylphenidate, where the tablets have to be swallowed whole. Children who are unable to swallow tablets cannot therefore take these. However, other long-acting stimulant medications Ritalin LA, Focalin XR, Metadate CD, and Adderall XR capsules can be opened, and the contents sprinkled onto a fluid or semi-solid food (such as yogurt). Nor is it a problem for Vyvanse capsules, which can be opened, and the contents completely dissolved in fluid.

Long-acting preparations are manufactured in different strengths, but sometimes a child requires a dose that lies between these strengths. In the case of a short-acting medication, the tablet can be broken into smaller pieces; however, in the case of the long-acting preparations Ritalin LA, Focalin XR, Metadate CD, and Adderall XR, the contents of the capsules cannot be divided into smaller doses. Even if a capsule is opened, *all* of the contents must be swallowed. The beads inside the capsule cannot be subdivided, as the proportions of immediate- and delayed-release beads present in the capsule will then be altered. For those children who require very small or intermediate doses of medication, Ritalin LA, Focalin XR, Metadate CD, and Adderall XR may not be available in the right strength. Vyvanse is different in that its contents can be completely dissolved in a known quantity of fluid after which the proportion of the solution that the child drinks will determine the dose. For example, if the contents of a 30 mg capsule of Vyvanse are dissolved in 100 ml of fluid, and the child is given only 50 ml to drink (the other 50 ml having been discarded), the dose the child receives will be 15 mg. In this way, a wide range of Vyvanse doses can be achieved using any of the available strengths of Vyvanse capsules.

**Types of long-acting stimulant medication**

The first long-acting preparations, developed in the 1980s, were unreliably absorbed and not widely used. Although available in the USA, they did not meet the safety criteria of some other countries, such as the UK and Australia. The active medication was often not absorbed from the capsule. Sometimes the whole contents of a capsule would be absorbed at the same time (known as *dumping*).

In the 1990s, more sophisticated methods of manufacturing long-acting preparations were developed, and these second-generation long-acting preparations are safe and reliable.

First-generation preparations include Ritalin-SR, dexamphetamine spansules, and compounded sustained-release capsules manufactured by pharmacists. These preparations should not be used, as the second-generation forms have superseded them.

Second-generation long-acting stimulants are of four types:

- a tablet that acts as micropump (e.g. Concerta);
- a capsule that contains a mixture of immediate- and delayed-release beads (e.g. Ritalin LA, Focalin XR, Adderall XR, and Metadate CD);
- a chemical compound that has to be broken down in the body in order to be activated (e.g. Vyvanse);
- an impregnated skin patch (e.g. Daytrana).

***Micropump tablets (Concerta)***

These are hard tablets that, once swallowed, act as tiny methylphenidate pumps.

The methylphenidate in a Concerta tablet is in the form of a compound known as a *polymer*. The polymer is of a thicker consistency than the ordinary form of methylphenidate. The casing of a Concerta tablet is lined by a special membrane that allows fluid normally present in the stomach and intestine to pass into the tablet but does not allow the methylphenidate polymer to pass out of the tablet. The only way the polymer can escape from inside the tablet is through a tiny laser-drilled hole (exit port) at one end of the tablet. This port is so narrow, and the polymer so thick, that the methylphenidate can escape only if actively pushed from inside the tablet. This is achieved by a compartment within the tablet known as the *push-compartment*. When a Concerta tablet is swallowed, fluid in the stomach and intestines is absorbed through the tablet wall and enters the push-compartment, causing it to swell gradually. The push-compartment is situated at the opposite end of the tablet from the exit port, and, as it swells, it squeezes the methylphenidate through the exit port and into the intestines, where it is absorbed.

The steady flow of methylphenidate from the exit port of a Concerta tablet is too gradual to initiate the effect of the methylphenidate. For this reason, the Concerta tablet is also coated with a layer of non-polymerized methylphenidate that is rapidly absorbed shortly after the tablet is swallowed. This produces a burst of methylphenidate that

raises the amount of methylphenidate in the bloodstream to a therapeutic level. This level is then maintained by the steady stream of methylphenidate extruded through the exit port. The total duration of action of a Concerta tablet is approximately 10–12 hours.

The outer coat of Concerta tablets cannot be digested and so passes intact through the intestines. The difficulty extracting the methylphenidate from the tablet, and the unsuitability of the polymer for sniffing or injecting, make it almost impossible to abuse.

The methylphenidate in a Concerta tablet is divided into two compartments. The compartment closest to the exit port is released first; the compartment further from the exit port is released second. The latter compartment has a higher concentration of methylphenidate, which means that the level of methylphenidate in the body of a child who takes a Concerta tablet is slightly higher in the second half of the day. This is a strategy for overcoming the body's tendency to reduce the amount of dopamine synthesized and released by the synapses (downregulation) once the medication starts working. This occurs because of a feedback mechanism at the synapse that reduces the synthesis of dopamine if the amount in the synaptic gap increases. This downregulation would normally cause short-term tolerance, a process known as *tachyphylaxis*.[2] The design of Concerta tablets, therefore, makes them able to counteract tachyphylaxis, which would reduce the efficacy of the medication in the latter part of the day. It should be noted that, while tachyphylaxis over the course of the day can occur with stimulant medications, chronic tolerance, in which the effect of the medication decreases over days, weeks, or years, does not occur.

#### *Timed-release beads in a capsule (Ritalin LA, Focalin XR Adderall XR, and Metadate CD)*

Ritalin LA (*LA* stands for long acting), Focalin XR (*XR* stands for extended release), Adderall XR, and Metadate CD (*CD* stands for controlled delivery) capsules contain a mixture of two types of bead. A proportion of the beads releases methylphenidate immediately after the capsule is swallowed. The release of the methylphenidate in the rest of the beads, which are coated, is delayed for approximately four hours. The medication is, therefore, absorbed in two separate pulses or phases (*biphasic release*). This doubles the duration of action of the medicine.

Ritalin LA, Focalin XR, and Metadate CD contain equal amounts of medication in the immediate-release and the delayed-release beads. A 20 mg capsule of Ritalin LA would therefore be the equivalent of

taking 10 mg of short-acting Ritalin, followed by another 10 mg of short-acting Ritalin taken four hours later.

Metadate CD is different, with 30% of the dose in the immediate-release beads and 70% in the delayed-release beads. A 20 mg capsule of Metadate CD would be the equivalent of taking 6 mg of short-acting Ritalin, followed by another 14 mg of short-acting Ritalin four hours later. The design of Metadate CD capsules, like that of Concerta tablets, aims to counteract tachyphylaxis. While this can be helpful in ensuring that the effect of the medication does not fall off as the day progresses, in those children with difficulty falling asleep at night, the tachyphylaxis that occurs with Ritalin LA, Focalin XR, and Adderall XR may be advantageous.

All four of these long-acting preparations use the same bead system to extend action. In all three, if a child cannot swallow the capsule, it can be opened and the contents sprinkled onto a teaspoon of fluid or semi-solid food, such as apple purée or yogurt. The teaspoon should be placed in the mouth and all its contents swallowed without chewing. Chewing would damage the coating on the beads. The beads should not be sprinkled on a glass of fluid, however, as the beads do not dissolve, and some will stick to the sides of the glass and not be swallowed when the fluid is drunk.

The absorption of these four long-acting medications can be adversely affected by a high amount of fat in the stomach. An excessive amount of fat damages the coating of the delayed-release beads.

***Chemical compounds requiring activation in the body (Vyvanse)***

Vyvanse contains a compound called lisdexamphetamine that is manufactured by chemically combining dexamphetamine with an amino acid, lysine. The bonding of dexamphetamine to lysine renders the dexamphetamine inactive.

The lysine bound to the dexamphetamine is not a drug. It an essential part of our diet found in the protein of meat, fish, and legumes. It plays major roles in protein synthesis, hormone and enzyme production, and the absorption of calcium. It is also important for energy production, immune function, and the production of collagen and elastin.

After a Vyvanse capsule is swallowed, the inactive lisdexamphetamine is rapidly absorbed into the blood stream where it circulates. Over the following 12 hours a naturally occurring enzyme in the red blood cells slowly breaks the bond between the dexamphetamine and the lysine, a process known as *hydrolysis*. This hydrolysis results in the slow release of free dexamphetamine that can act on the synapses in the brain. This makes Vyvanse an extended-release formulation of

dexamphetamine. The body treats the lysine that is freed by the hydrolysis as a nutrient.

Vyvanse is therefore a drug precursor (*pro-drug*) progressively activated in the body over the course of approximately 12 hours. It is the most reliable long-acting dexamphetamine preparation available. As a pro-drug, Vyvanse cannot be abused, because if it is injected, swallowed, or sniffed, the bound dexamphetamine is inactive and cannot give an immediate 'high'. Even when the dexamphetamine is activated in the bloodstream, this process occurs too gradually to give someone taking Vyvanse a 'high'.

Vyvanse capsules may be taken whole, or the capsule may be opened and the entire contents dissolved in a glass of water. As described in the section 'When not to use long-acting stimulant preparations', the proportion of the solution that the child drinks will determine the dose.

***Skin patch (Daytrana)***

Daytrana is an adhesive skin patch containing methylphenidate. The patch is attached to the hip area in the morning and usually worn for nine hours; however, its effects can continue for three hours after it has been removed. It may be removed sooner than nine hours, so that the child's treatment can be adjusted to his specific needs on the day. For example, the schedule may vary on certain schooldays, weekends, and holidays.

Besides the usual side effects associated with methylphenidate itself when taken orally, mild skin irritation (light pink to red) at the site of the patch is common after the first application. In most cases, this irritation disappears within 24 hours. It is possible, however, to develop an allergic reaction to Daytrana, so inform your child's doctor about any more severe rash that develops in areas where the patch has been applied.

To reduce potential skin side effects, alternate the hip on which the patch is worn, and put the patch in a slightly different place on the hip each time. Always remove the patches gently. If required, oil-based products (e.g. petroleum jelly) can be used to loosen any residue from the patch adhesive. Follow-up baths and showers, with immediate application of moisturizers, may be beneficial, but creams and ointments should not be applied immediately before applying the patch.

## Non-stimulant medications

Stimulant medications, in both short- and long-acting forms, are the mainstay of the treatment of ADHD with medication. However, there are number of non-stimulant medications that may be used in place of, or in combination with, stimulant medication.

## Tofranil (imipramine)

Tofranil has been used for many years to treat bed-wetting in children, as well as to treat depression in both children and adults. Its usefulness in children with ADHD has been well established. It is not a stimulant; it belongs to the family of tricyclic antidepressant medications.

It is used in smaller doses in children with ADHD than for bed-wetting and depression. However, in children with ADHD who have bed-wetting or depression in addition to ADHD, larger doses can be taken.

Tofranil is a long-acting medicine that remains in the body for some eight hours after a tablet is taken. The medicine is given regularly with the aim of achieving a steady level in the blood. For this reason, the exact timing of each dose is not as critical as it is for stimulant medications. Because the blood level must be built up slowly, it usually takes two weeks before the full action of Tofranil becomes evident. Tofranil can help with all the major difficulties seen in children with ADHD. It improves concentration, decreases impulsivity, and reduces oppositional behaviour.

### Administration

The aim of treatment with Tofranil is to achieve a steady level in the blood and consequently the medicine is given seven days a week. The tablet is usually given with breakfast. Sometimes a second tablet is given in the evening as well.

### Side effects

Tofranil is used in such low doses for ADHD that side effects are uncommon. When treatment is first started, the child may suffer from sleepiness or tire easily, but this is usually mild and resolves after a week or two.

Other possible side effects are slight dryness of the mouth, constipation, and excessive perspiration. It is rare for these side effects to be troublesome enough to necessitate stopping the medicine. Constipation can usually be counteracted by ensuring that the child has sufficient fibre and fluid in his diet.

The occasional child will experience a decrease in appetite on Tofranil, but rarely to the extent that occurs with stimulant medication.

One of the drawbacks of Tofranil is that the positive effects may wear off over time. This chronic tolerance may be remedied by raising the dose or stopping the medicine for a period before reintroducing it.

Tofranil should not be used in children with disorders of heart rhythm. Such disorders are rare, but it is best for the doctor to arrange for the child to have electrocardiography, a non-invasive test that produces an electrical trace of heart rhythm (*electrocardiogram*).

Tofranil should not be given concurrently with a stimulant medication as this combination can cause problems with heart rhythm even in a child without a pre-existing heart rhythm disorder.

**Withdrawal**

When the Tofranil is no longer needed, it is usual to withdraw it gradually over a couple of weeks in order to prevent rebound depression. This is not necessary if the dose taken is small (i.e. 10 mg a day or less).

## Clonidine (Catapres, Dixarit)

In the late 1970s it was first proposed that clonidine, a medicine that had been used for a decade to prevent migraines and treat high blood pressure, was effective in treating ADHD in some children with the condition. It belongs to the family of medicines known as alpha-agonists.

The main effect of clonidine is on the neurotransmitter norepinephrine, and clonidine is extremely effective in children with oppositional or aggressive behaviour. It can also reduce anxiety. Sometimes clonidine is taken in the evening only to promote sleep in children with ADHD who suffer from insomnia.

The safety of combining clonidine with a stimulant medication has been a matter of controversy. Concern first arose in the late 1990s that this combination could lead to heart irregularities and even death. There has been subsequent evidence that has convinced many doctors that this concern is unfounded. While many doctors use this combination, others still avoid it. A decision to combine these medications needs to be discussed with the child's paediatrician.

**For daytime symptoms**

When it is used for daytime symptoms of ADHD, clonidine must be given regularly in order to achieve a constant level in the bloodstream.

It is given at least twice a day, and in some children up to four times a day, in order to achieve a steady level in the blood. Clonidine must be taken seven days a week. When treatment begins, the improvement may not be evident for several weeks. The earliest effect is usually observed after ten days, but it may take two or three months before the maximal beneficial effect is apparent.

**For insomnia**

Children with ADHD often have great difficulty falling asleep (sleep-onset insomnia). Their minds are so active that even young children with the disorder may remain awake until the early hours of the morning. Many children with the condition become very distressed by their inability to fall asleep, which only makes this difficulty worse. Many are exhausted and irritable the next day because of lack of sleep.

It is important to be aware that stimulant medication may contribute to the insomnia and the dose (particularly an afternoon doses if taken) should be reduced if possible. For many children this is not helpful, either because they require a higher dose of stimulant medication to function adequately, or because their insomnia is unrelated to the stimulant medication. The first step in helping a child with insomnia should always be by non-medical means. The child should not have any stimulating food or drink (such as tea, coffee, cola, or chocolate) before bedtime. He should not be allowed to play computer games, watch violent TV shows or DVDs, or listen to stimulating music (techno or rock music) before bed. Arguments and schoolwork should also be avoided late in the evening, if possible. Soothing background music, calming stories, or meditations may be helpful at bedtime. Warm milk drinks may also help some children to settle at night.

If insomnia remains a significant problem despite these measures, melatonin, a medication that resets the body clock, is often prescribed. This should be taken an hour before bedtime. Short-acting melatonin helps with sleep-onset problems, and prolonged-release melatonin helps with night-time waking.

If melatonin is not effective, a small dose of clonidine at night may be helpful. Clonidine, like melatonin, is far preferable to sleeping tablets because it is not habit-forming and does not induce chronic tolerance. It also does not make the child sleepy but rather settles his mind so that he can relax. The effect comes on after approximately one hour and is short-lived, so the child should try to sleep during the first couple of hours after it has started to work.

When it is used to promote sleep in children with ADHD, clonidine is given as a single evening dose one hour prior to bedtime. At first a small dose is tried, and this is gradually increased until the desired effect is attained, or until the maximal permissible dose is reached.

The medication does not have to be given every night. It can be reserved for nights when non-medical measures to promote sleep have failed.

**Administration**

Clonidine is sometimes available in a weaker coated tablet (Dixarit) marketed to prevent migraine, and a stronger uncoated tablet (Catapres) marketed to treat high blood pressure. Either of these preparations can be used, but Catapres tablets will need to be broken into quarters or halves for most children with ADHD.

In some countries, clonidine is available as an extended-release tablet (e.g. Kapvay). Clonidine may also be available in the form of a skin patch, e.g. Catapres-TTS (*TTS* stands for transdermal therapeutic system). This is a small adhesive patch impregnated with the medicine that adheres to the skin (usually on the back). The medicine is then absorbed steadily through the skin during the day.

Extended-release tablets and the skin patch both avoid the necessity for repeated tablet-taking to control daytime symptoms. With the skin patch there is the problem that the child may pull it off.

A child who is taking daytime clonidine should have his blood pressure measured before the start of treatment and at intervals during the course of treatment.

**Side effects**

Clonidine is free of any significant side effects when used in the doses usually required for ADHD. Some children may become drowsy when they first start this medicine for daytime symptoms, but this side effect quickly subsides.

Clonidine is usually used in such small doses in ADHD that there is no appreciable effect on blood pressure. Some children may feel dizzy if the dose is excessive, and this may indicate that their blood pressure is being lowered. The dose should then be reduced.

Parents should be aware that behaviour may initially deteriorate when treatment with clonidine commences. If treatment is continued, the positive effects will be seen after two or three weeks. Parents may therefore have to prepare for some worsening of behaviour when treatment with clonidine is started.

For children who have migraines in addition to ADHD, treatment with clonidine may prevent their headaches, as clonidine is also used in small doses to treat migraine. Ironically, despite its use to treat migraine, clonidine can cause headaches in some children.

**Withdrawal**

When clonidine is used for daytime symptoms of ADHD, and treatment involves the use of more than 50 µg (*micrograms*) of clonidine a day, the medicine should not be stopped suddenly. It should be withdrawn slowly, using decreasing doses, over a period of two to three weeks to prevent *rebound hypertension*, a condition where blood pressure rises on sudden cessation of clonidine. When a child is taking a dose above 50 µg a day, he should not miss a dose for the same reason. If treatment involves a dose lower than 50 µg per day, clonidine can be stopped abruptly when no longer needed.

When clonidine is taken as a single nightly dose to promote sleep, withdrawal is not usually a problem.

## Long-acting guanfacine (Intuniv)

Short-acting guanfacine (Tenex) has been available since 1986, while long-acting guanfacine (Intuniv) was introduced in 2009. There is now more evidence to support the use of long-acting guanfacine than short-acting guanfacine in ADHD and it is long-acting guanfacine (Intuniv) that is described here.

Intuniv, like clonidine, belongs to the family of alpha-agonists and it shares the therapeutic effects and the potential side effects of clonidine. Like clonidine, it is effective in children with oppositional or aggressive behaviour. It can also reduce anxiety.

Unlike clonidine, the safety of combining Intuniv with a stimulant medication has not been a cause of concern and the two medications are often combined. The effect of Intuniv in combination with a stimulant medication often results in better control of the ADHD, as well as a reduction in side effects. This is because Intuniv counteracts insomnia, one of the main side effects of stimulant medication. Intuniv promotes sleep and is often the cure of insomnia caused by stimulant medication. In addition, Intuniv has a greater effect on behaviour, particularly aggression, temper tantrums, and defiance, than it does on concentration. For this reason, its combination with one of the stimulant medications (whose primary action is on concentration and learning) is complementary.

**Administration**

Intuniv is taken as a single morning dose. It is a long-acting medicine, and a single morning dose will last until the evening. Intuniv tablets are specially designed so that the medication is released slowly. They should not be broken, chewed, or crushed. They should not be taken with a high-fat meal because this interferes with absorption.

A child should be started on a small dose (1 mg) and this is usually increased at two-weekly intervals. Once the target dose (which is based on the child's weight) is reached, it takes two to six weeks for the full effect to occur. The maximum permissible dose is based on the child's weight. Children on Intuniv should have their heart rate and blood pressure measured prior to starting treatment, after each dose increase, and then at three- to six-month intervals while on treatment.

**Side effects**

As in the case of clonidine, low blood pressure, drowsiness, and dizziness are the most common side effects. These side effects often subside as the body adjusts to the medication.

**Withdrawal**

If the dose of Intuniv is more than 1 mg a day, the medicine should not be stopped suddenly. It should be withdrawn slowly using decreasing strengths over a period of two to three weeks to prevent rebound hypertension.

## Atomoxetine (Strattera)

Atomoxetine (Strattera) was first released in early 2003. Its action is not on dopamine, but on another neurotransmitter, norepinephrine, that is involved in some children with ADHD. Strattera selectively inhibits the reuptake of norepinephrine by the nerve that produced it, thereby making more norepinephrine available for transmission of the impulse. This mode of action means that Strattera may be useful for some children with ADHD who do not respond to stimulant medication.

Strattera mainly helps impulsivity and restlessness. It is not as effective as a stimulant medication in improving concentration and children who benefit from taking it often require stimulant medication in conjunction with Strattera to improve concentration and learning.

While some children require a high dose of a stimulant medication in order to function, they may not tolerate such a high dose. Such a child may not be helped sufficiently by Strattera alone, but when Strattera is combined with the stimulant medication, it may be possible to reduce the dose of stimulant medication and still get good control of the child's

symptoms. The Strattera is then said to be *stimulant sparing* in that it saves (spares) the use of a high dose of stimulant medication.

When Strattera was released, the availability of a non-amphetamine medication for ADHD caused much excitement in the media and among parents. It may be favoured over stimulant medication by some parents because of the adverse publicity given to Ritalin by the media. Nevertheless, it should be remembered that atomoxetine is a relatively new medicine, without the well-established, long-term safety record of the stimulant medications. It is also less effective in improving concentration and learning. In addition, it takes a couple of months before it becomes apparent whether it is working, while stimulant medication works straight away. Lastly it is not without its own set of side effects. It should therefore be regarded as a second-line medication for ADHD.

**Administration**

Strattera is a long-acting medicine, and a single morning dose will last into the evening. It does not cause difficulty with falling asleep and can, therefore, be used to help children who have difficulties in the late afternoon and evening. Taking a divided dose twice a day (morning and evening) can be beneficial for children who have difficulties in the early morning as the medication is then active in the body on waking.

The capsule must be swallowed whole as the contents are irritating to the lining of the oesophagus. Capsules are usually taken once a day, most often in the morning. Strattera is started at a low dose, which is gradually increased to a target dose that is calculated on the basis of weight and age. It is less effective if doses are skipped. If it is to be stopped, there is no need to withdraw the medication gradually. A child should be started on a small dose and this is usually increased at weekly intervals. Once the target dose (which is based on the child's weight) is reached, it takes four to six weeks for the full effect to occur. The maximum permissible dose is based on the child's weight.

**Side effects**

The more common side effects are indigestion and drowsiness, both of which usually resolve after a few days. More serious, but rare, side effects are suicidal thinking and behaviour, and liver toxicity. It is important to discuss these side effects with the prescribing doctor so that you know how to detect them early.

[1] Trade names, such as Ritalin, are written with a capital letter, while generic names, such as dexamphetamine, are not.

[2] Tolerance refers to the phenomenon that occurs when a medication no longer works as well as it once did. If this occurs after many months of treatment it is referred to as *chronic tolerance*. Tachyphylaxis is tolerance that is restricted to the course of a single dose of a long-acting medication.

SECTION 6

# Unorthodox treatments

# 17

# Unconventional treatments

## Key points

- Many misguided or dishonest individuals promote all manner of alternative ‘treatments’ for ADHD.
- The media often play an active role in irresponsibly promoting discredited treatments.
- If you plan to start a treatment, first be certain that you understand the risks involved.

The treatment of ADHD outlined in this book involves the combination of a number of different modes of treatment (*multi-modal treatment*) selected according to the needs of the individual child. These treatments include behaviour modification programmes, remedial education, and medication. Such treatments must be individualized and kept under regular review, so that they can be modified as the child’s needs change. Scientifically conducted trials have shown that this form of multi-modal treatment provides the best results over time.

## Evaluating an alternative treatment

There are no quick and easy ways of overcoming ADHD and no outright cures. Unfortunately, many misguided or dishonest individuals promote all manner of alternative ‘treatments’ for ADHD. Such treatments may claim to cure the condition or reduce symptoms.

Some alternative treatments are a waste of time and money that could be spent more profitably in other ways to benefit the child. Some are potentially harmful to the physical and/or psychological well-being of the child. Some may have detrimental effects on the family as a whole.

It is important, therefore, that you obtain reliable information from your child's doctor before becoming involved in any treatment. Do not rely on stories of miraculous cures from those who promote, or have used, these treatments. Children with ADHD generally show improvement over time. In addition, almost any intervention will have a positive effect because the mere act of doing something for the child will raise her morale and boost her self-esteem. Changes should not be ascribed to a particular treatment without independent scientific evaluation.

Evaluations should be by controlled trials published in reputable scientific journals. Such trials should be carried out *blind*, meaning that the person who assessed the performance of children both on and off the treatment did not know which had received the treatment and which had not, until after the assessments were completed. If the treatment consists of a medicine, the untreated group should have received a placebo. A placebo is an inactive substance used to compare the outcome with an active substance. When treatment does not involve the administration of a medicine, a *sham treatment* should be given, if possible, to make the comparison valid. In a sham treatment, the therapist goes through the motions without actually performing the treatment. In addition, the person or team who carries out the trial should not have a vested interest in the treatment.

An increasing number of independent trials of controversial treatments are now reported in scientific journals. In addition, professional and government bodies often make policy statements about certain treatments based on reviews of the scientific data.

If you plan to start a treatment, first be certain that you understand the risks involved. Decide upon what outcome you wish to see, and how long it should take before this occurs. If the objective improvement is not achieved, treatment should cease. Do not allow yourself to accept some vague improvements decided upon at a later date.

## The role of the media

The media (television, newspaper, and radio) often play an active role in promoting controversial treatments. Journalists and reporters are continually on the lookout for attention-grabbing stories that will increase their circulation or ratings. Unfortunately, many journalists and reporters covering medical matters have little, if any, scientific

training. Some are prepared to quote selectively in order to make their coverage more interesting.

Producers of radio and television programmes, particularly those dealing with current affairs and health matters, are aware that sensationalism improves ratings. They may, therefore, cover alternative treatments with an eye to entertainment, rather than to providing balanced information. A common tendency is to promote a treatment as novel (therefore justifying its coverage and creating excitement and interest), even when it has been available for some time and has been shown to be ineffective.

Unscrupulous media presenters are greatly assisted in their efforts by the desire for publicity of those who provide these treatments. By contrast, many conventional experts avoid media appearances because of concern that they may be accused of advertising or self-promotion by their professional regulatory bodies and colleagues.

Parents should, therefore, be wary of media coverage of ADHD. This also applies to information about treatment of ADHD on the Internet, as many sites that purport to provide balanced information have been established to promote a particular form of treatment. The accuracy of information on the Internet is not subjected to any test of validity or authenticity. A list of reputable Internet sites dealing with ADHD is listed in the Appendix of this book.

## Some widely promoted treatments

Although numerous controversial treatments are promoted, with new ones continually appearing, most fall into one of a number of categories. These are: dietary treatments, herbal treatments, programmes involving technological apparatus, exercises, manipulations, and meditation.

### Dietary treatments

Dietary treatments for ADHD are based on beliefs about the ways in which food may play a role in causing or aggravating ADHD. The mechanisms suggested are food intolerance, food allergy, and dietary deficiency.

Food intolerance occurs when the body lacks substances required to digest or metabolize food, with the resultant accumulation of harmful substances derived from the incomplete digestion or faulty metabolism of the food by the body. Allergy occurs when a specific

part of the body's immune system interacts with a component of food to generate a harmful reaction. Dietary deficiency occurs when the diet is lacking in a particular component required for maintaining health.

Removing the harmful substance from the diet (an elimination diet) treats intolerance and allergy, while administering the deficient substance as a dietary supplement corrects deficiency. Both elimination diets and dietary supplements have been promoted as treatments for ADHD.

**Elimination diets**

There is no doubt that allergic disorders, such as asthma and hay fever, may impair a child's ability to concentrate and to behave appropriately because they undermine a sufferer's feeling of well-being. Such clear-cut allergic disorders may, therefore, worsen the condition of a child with coexisting ADHD and should be properly treated. However, the belief that ADHD itself is caused by food allergy in the absence of such specific conditions, as is suggested in some quarters, is unsupported by research findings. Those who make such claims have not produced satisfactory evidence to support their assertions. On the contrary, the evidence that ADHD is due to a genetic impairment in neurotransmitter metabolism is incontrovertible (see Chapter 10).

The practice of putting children with ADHD on allergy diets to improve concentration or behaviour is not justified in the light of the scientific evidence. Blood and skin tests for allergy have no place in the treatment of ADHD.

If a child is put on an exclusion diet, it should be supervised by a doctor to ensure that she is receiving adequate nutrition. Radical exclusion diets, in which one or more food groups are excluded, may be dangerous and should be avoided.

The best way to evaluate the diet is for an independent observer, such as a teacher, to monitor the child's performance without knowing when the child is on the diet and when she is eating normally. It is important that the observation extends over three periods:

- when the child is on a normal diet
- when she is on the elimination diet
- when she is back on the normal diet.

If the diet is truly helping the child, her condition should improve on the elimination diet *and* deteriorate again when the normal diet is commenced.

One example of an elimination method is the *Feingold diet*. In 1973, Benjamin Feingold, a Californian allergist, published a book called *Why Your Child Is Hyperactive.* In it, Feingold proposed that certain substances in the diet were the cause of hyperactivity in children. Despite the fact that Feingold's theory was not based on scientific research, it was extensively covered by the media and came to be widely accepted by large sections of the general population.

The supposedly harmful dietary substances identified by Feingold were artificial colourings, flavourings, and preservatives added to food. He also implicated a group of substances known as salicylates, some of which occur naturally in certain foods. To treat hyperactivity, he proposed what is now known as the 'Feingold diet', which excludes all foods containing the substances implicated by him. Many fruits are not permitted in the diet as they contain naturally occurring salicylates. As preservatives, colourings, and flavourings are ubiquitous in food, the diet is very restrictive and involves a major change in shopping, cooking, and eating. Feingold also recommended the avoidance of over-the-counter and prescription medicines, as well as certain other substances such as toothpastes, mouthwashes, and perfumes.

Current recommendations advocated by followers of Feingold involve a two-stage plan that begins with elimination of artificial colours and flavours, certain antioxidants, and salicylate-containing products (including foods containing naturally occurring salicylates). If improvement occurs and lasts for over four weeks, the proscribed foods are then reintroduced one at a time to check if they can be tolerated.

Many parents who have followed Feingold's recommendations have reported improvement in their child's behaviour. However, carefully designed experiments have generally failed to support the idea that the diet results in the improvements claimed by its supporters. When improvements have occurred, they affected a small minority of children, were small, and were of short duration.

The diet is of no benefit in children with the inattentive form of ADHD but may cause some slight improvement in the overactivity, impulsivity, task impersistence, and distractibility of a small proportion of children with the combined form of the condition. The diet is

difficult to keep to in its strict form but is nutritionally sound, provided care is taken to ensure that there is an adequate intake of vitamin C.

Experts have noted inconsistencies in Feingold's 1973 book. The foods he recommended include some that are high in salicylates and exclude others that are low in salicylates.

### Dietary supplementation

While it is true that brain neurotransmitters are formed from certain elements in our diet, ADHD is due to a genetically determined defect in neurotransmitter metabolism at the synapse that is unrelated to nutritional components of neurotransmitter formation.

In the Western diet, there are excess amounts of all the substances (substrates) required for neurotransmitter production, and nutritional deficiencies leading to ADHD have never been described.

Numerous trials of supplements in children with ADHD have been reported in the medical literature. Substances studied have included amino acid mixtures, essential fatty acids (e.g. fish oil), L-carnitine, glyconutritional supplements, dimethylaminoethanol, mega-vitamin mixtures, and minerals (e.g. iron, zinc, and magnesium).

None of these substances has been shown to be of benefit in children with ADHD. Some may be detrimental to a child's health. For example, excessive amounts of fat-soluble vitamins (vitamins A and D) cannot readily be excreted by the body, and may accumulate and cause toxic effects, slowing down the child's development, and causing ill health and even death.

Efamol Efalex Oil is a patented combination of a fish oil supplement and a herbal extract (evening primrose oil). It has been actively marketed as a treatment for a number of conditions, including ADHD. Jacqueline Stordy, its originator and patent holder, has travelled the world giving talks to encourage its sales and has written a book to promote its use. An objective examination of the reports used to back up its use shows no convincing evidence of any benefits to children with ADHD.

Furthermore, the high fat content of the preparation may interfere with absorption of medications taken concurrently for treatment of ADHD and so render them less effective.

## Herbal treatments

There has been a proliferation of herbal substances promoted for the treatment of ADHD. These include *Ginkgo biloba*, evening primrose

flower oil, St John's wort, Brahmi herbs, Pycnogenol (extracted from pine bark or grape seeds), and a range of Chinese herbal cocktails.

Such substances are promoted on the basis that they are a 'natural' form of treatment. This claim is often accepted at face value without careful consideration of its validity or implications. Three fundamental questions should be considered before accepting the concept that 'natural is best':

1. Is the treatment, and not just the substance used, in fact 'natural'?
2. Are natural substances necessarily safe?
3. Are natural substances adequately tested for efficacy and safety?

With regard to the first question, the fact that a treatment involves a naturally occurring substance does not make the treatment itself 'natural'. For example, if a child is given a naturally occurring substance that is not part of the normal human diet, such as the oil extracted from the evening primrose plant, this cannot be regarded as a 'natural' treatment. The plant may have produced the oil naturally, but it is not natural for a child to ingest large amounts of this oil on a regular basis. Children do not normally eat evening primroses and, even if they did, they could never ingest enough to take in the amount of oil present in the extract. Administering such an extract to child must be regarded as unnatural and experimental. There is a risk that the ingestion of this oil may be harmful to the child.

The second question asks if naturally occurring substances are necessarily safe. The answer is no. We have only to consider such naturally occurring plants as the tobacco plant, the deadly nightshade, the opium poppy, or the cannabis plant to realize that nature is full of harmful substances. Every year many individuals are hospitalized because of the toxic effects of plants. Some of these individuals succumb to the effects of these plants on organs such as the liver and kidneys. Some of the most beautiful plants, with the most alluring names, are among the most toxic, a phenomenon that has been referred to as the *siren syndrome*. A pretty flower on the label of a bottle of herbal treatment is no guarantee of the safety of its contents.

Finally, are natural substances adequately tested for efficacy and safety? It is true that many drugs prescribed by conventional doctors are extracted from plants and other living organisms. For example, the drug *digitalis* comes from the foxglove and *penicillin* from potato mould. However, before such plant extracts can be sold as conventional medicines, they have to be subjected to rigorous checks

of purity and numerous clinical trials of efficacy and safety. They must then be registered for use by a government authority that will place controls on standards of manufacture, availability, and the content of prescribing information available to doctors and consumers. All adverse effects must be reported by doctors and pharmacists to a government monitoring body. When they are prescribed, precise doses are specified and dispensed, based on scientifically conducted research.

Naturally occurring substances used by alternative practitioners are not generally subjected to the same checks and evaluations. Their manufacture is often crude and haphazard, and their use based on anecdote and faith, rather than on scientific evidence. Toxic effects become apparent only through usage and may not be reported. Only now, for example, are we discovering the side effects and drug interactions of alternative medicines such as St John's wort and valerian. They have been accepted as 'safe' for many years without having undergone the rigorous evaluation to which all medicinal substances should be routinely subjected before and after use.

When herbal substances promoted as treatments for ADHD have been subjected to controlled trials, beneficial effects were not found.

## Technological treatments

Treatments that involve the use of some form of special electronic equipment often impress parents and their children. However, no matter how sophisticated the technology, claims made for such treatments should be subjected to the same scientific testing of efficacy and safety as any other mode of treatment. The main examples of such treatments are EEG biofeedback therapy (neurotherapy) and sound therapy (SAMONAS and Tomatis methods).

### EEG biofeedback therapy

In this form of treatment, sometimes known as neurotherapy, the child's brainwave pattern (EEG) is monitored while she is trained to increase certain frequencies of brain electrical activity. To monitor the EEG, the child wears a cap on her head onto which wires are attached. These wires are connected to a computer that continuously measures brain electricity during the training session. The software on the computer enables the child to play computer games that reward her if she is able to alter her brainwave pattern in the way

desired. Claims are made that such training sessions decrease the symptoms of ADHD.

There does not seem to be a consensus among proponents about how many sessions are required. Each session lasts approximately 30 minutes and often as many as 80 sessions are recommended.

EEG biofeedback is not new: it has been used for over 60 years. However, the decreasing cost of computers, and the fact that a licence is often not required to carry out EEG biofeedback therapy, means such treatments are now more widely available and are actively marketed.

After over three decades of use, despite claims to the contrary by those who have a vested interest in the treatment, credible scientific evidence for the efficacy of EEG biofeedback in the treatment of children with ADHD is still not available.

**Sound therapy**

In this treatment, the child listens to specially prepared recorded music through headphones. The recordings have been electronically modified to remove and/or introduce specific sound frequencies. These modifications are not audible to the listener, who hears only ordinary (usually classical) music. The proponents of sound therapy claim the modifications are perceived subliminally and have a positive effect on brain function.

This form of treatment has a great deal of pseudoscience and mystique attached to it. It is sometimes known as the *SAMONAS method*, an acronym for *S*pectral *A*ctivated *M*usic of *O*ptimal *Na*tural *S*tructure, a description of the way the sound is altered. It is also referred to as the *Tomatis method* after a Paris ear, nose, and throat specialist, who designed an apparatus called the *electronic ear* that could manipulate the frequencies of sounds. He claimed that his apparatus could boost deficient sound frequencies heard by a singer so that his or her singing voice would improve. Singers flocked to him for treatment in the 1930s.

The scientific study of sound therapy is hampered by the fact that there is no consensus among sound therapists about how the sound should be altered. Since the alteration to the sound is not audible (some sound therapy recordings may even be unaltered), any perceived benefit may be an example of the ‘emperor’s new clothes’ phenomenon. Properly conducted research has failed to show any significant positive effects of sound therapy for children with ADHD.

## Exercise programmes

Exercise has been a popular form of alternative treatment for learning and behavioural difficulties in ADHD. Every few years a new programme containing variations of the same simple exercises is developed and promoted as a treatment for ADHD.

The media, particularly TV, often give extensive, upbeat coverage of such programmes: footage of children carrying out exercise programmes provides excellent visual images for TV. Such treatments usually involve manoeuvres such as getting children to spin, ride a scooter down a ramp, swing, and crawl.

On the basis of theoretical considerations, and the research evidence, it is highly unlikely that a child can learn a complex skill such as attending to a task or reading by carrying out an exercise such as jumping on a trampoline. Time spent on such manoeuvres is probably better utilized by giving the child an opportunity to practise the specific skill that she needs to learn, whether that be spelling or writing neatly.

The *Dore Programme*, prominent in the first decade of the twenty-first century, was one such treatment—a reincarnation of the simplistic belief that a series of exercises can overcome conditions such as reading disability (dyslexia) and ADHD. The treatment was a business venture of the UK tycoon Wynford Dore. He claimed the exercises helped his daughter overcome her learning difficulties and he extravagantly promoted his treatment centres with glossy websites and extensive media publicity. Treatment centres were established despite the absence of external, longitudinal, scientific evidence of any benefit to children with ADHD or dyslexia.

Like all other such exercise programmes, the Dore programme received extensive, positive TV coverage. Despite claims to the contrary, the exercises were not new. They bore a marked resemblance to the exercises developed over the previous 30 years by New York doctor Harold Levinson. The claims made that children were making spectacular progress were difficult to credit.

The original company behind the Dore programme went into liquidation in 2008, leaving thousands of parents out of pocket. Another company acquired the intellectual property rights, and this treatment is still being promoted.

## Manipulation

Chiropractors use manipulation of the spine as a method of treating all manner of diseases. This form of treatment has not been shown to be of benefit to children with ADHD.

## Meditation

The claim has been made that teaching children and adults with ADHD to meditate improves their behaviour, mood, and learning. However, at present, evidence supporting this claim from a large, randomized trial is not available.

SECTION 7

# Adulthood

# 18

# ADHD in adulthood

Key points

- In a sizeable proportion of children with ADHD, their difficulties persist into adulthood.
- When the symptoms of ADHD, such as poor attention span and impulsivity, persist into adult life, this is known as *residual ADHD*.
- When an adult has problems that arose as a result of his having had childhood ADHD, such as poor academic skills and low self-esteem, these are known as *secondary problems*.

## Will he grow out of it?

Four decades ago, the general consensus was that children with ADHD would invariably grow out of their problems. This has now been disproved. In a sizeable proportion of children with ADHD, the difficulties persist into adulthood. Such difficulties may take the form of residual ADHD, secondary problems, or a combination of the two.

## Residual ADHD

When the symptoms of ADHD, such as poor attention span, impulsivity, and restlessness, persist into adult life, this is known as *residual ADHD*.

In the majority of children with ADHD, these difficulties decrease during late adolescence. There may be a gradual decrease between the ages of 12 and 18 years, or it may occur more abruptly (usually around 16–18 years). In some children, the improvement in the later teenage years is so marked that their ADHD can be regarded as having completely resolved. This occurs in some 20% of children with ADHD.

In approximately 80% of children with ADHD, the improvement in the teenage years will not be associated with a complete resolution, and approximately 60% will have mild residual ADHD and 20% a severe form (Fig. 18.1).

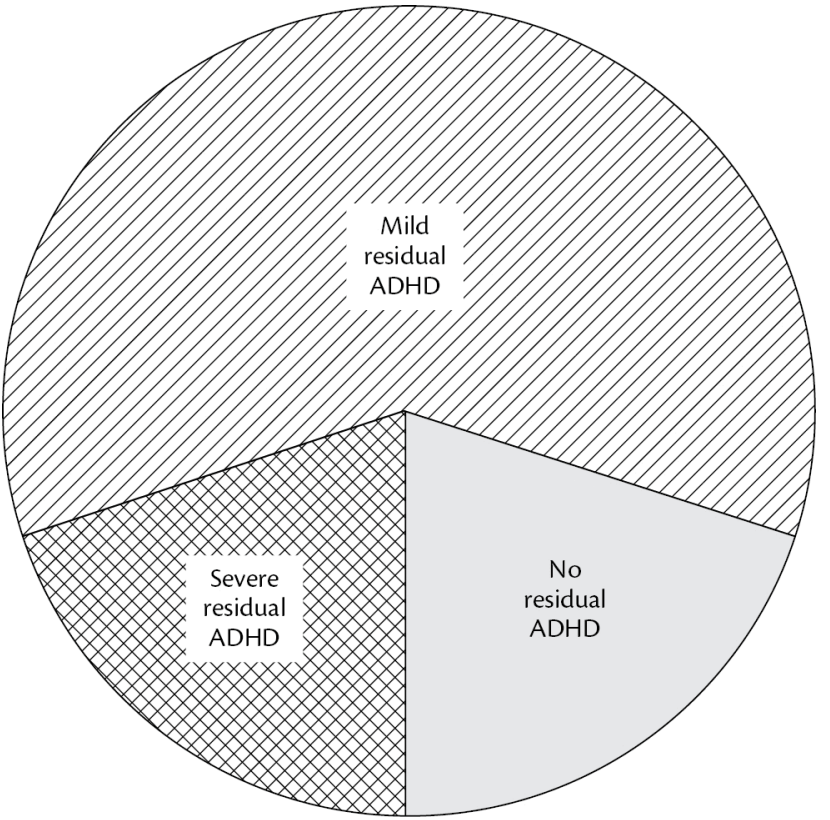


**Fig. 18.1** The proportion of children with ADHD who have residual ADHD in adulthood.

Adults with mild residual ADHD will usually not be hampered by their condition. Many will simply 'bypass' their difficulties by making career and other life choices so that their difficulties with sustained attention, social cognition, or impulsivity do not interfere with their day-to-day functioning.

Some adults with this residual form of ADHD may even turn some of their 'difficulties' into assets. For example, a certain degree of restlessness may help such a person attain goals, because it makes

him more energetic and less prone to become tired than other people. Impulsivity of thought can also be turned into an advantage if it allows the individual to think laterally and innovatively. Even some minor difficulties with social cognition may allow the individual to be more successful in some endeavours where being forthright is an advantage. Many individuals with mild residual ADHD do extremely well in the business world.

In approximately 20% of children with ADHD, difficulties persist into adulthood in a severe form. These individuals have residual ADHD that often hampers their family life and their work. It is these individuals for whom ongoing treatment of ADHD during adulthood is essential. This will be discussed later in the chapter.

## Secondary problems

The term *residual ADHD* refers to persistence of the characteristics of ADHD, such as impulsivity and restlessness, into adulthood. Many adults who had ADHD during childhood will have other, secondary, problems that arose because of their ADHD in childhood. For example, their ADHD may have resulted in their inability to develop good academic skills or may have undermined their self-esteem.

Whether or not the ADHD itself persists, many adults who had ADHD in childhood will continue to suffer as a result of these complications. Through early treatment of children with ADHD, the secondary problems that ADHD causes during childhood, and which may then persist into adult life, can be reduced or avoided.

It is important to distinguish secondary problems from residual problems. Secondary problems may exist in adults who have residual ADHD, as well as in adults in whom the primary characteristics of ADHD have resolved. The latter group may still need help in the form of counselling, adult education, self-support groups, and specialist help with career advice and employment support.

A person with secondary problems who does not have residual ADHD would not benefit from medication for ADHD. This is quite different from adults with residual ADHD, where medication for ADHD may play an important role in helping reduce their symptoms.

## Characteristics of residual ADHD

Residual ADHD is due to the persistence of the features of childhood ADHD (see Chapter 1). The characteristics are very similar, but with

adulthood the nature of some problems changes.

Adults with ADHD have tremendous difficulty completing projects. They will often have a number of different projects that they are tackling simultaneously without properly following through on any of them. Their difficulties with task persistence often involve procrastination; they experience great difficulty getting started with a task.

Easy distractibility and difficulties focusing attention are common. Many adults with ADHD complain that they tend to lose track when reading. Their partners and children often complain that they 'tune out' when they speak to them.

Impatience is a prominent characteristic of residual ADHD. Adults with ADHD are often very intolerant of 'red tape'. They have difficulty going through necessary procedures and often develop reputations for being mavericks. They are quick to become frustrated and to give up if they meet adversity.

They are restless individuals and are intolerant of what they regard as 'boring' activities. They find it difficult to relax in leisure activities that do not require a high level of activity. They frequently have a low tolerance for frustration and quickly lose their temper or give up if a task requires persistence. They have particular difficulty working at tedious tasks that require incentival motivation (motivation for a reward that is far off in the future).

Adults with ADHD find it difficult to get themselves organized. They can be very creative and intuitive but will often need someone else to ensure that the more practical, day-to-day arrangements are made.

Impulsivity is a particular problem for many adults with residual ADHD. For many, it is the most prominent characteristic. Impulsivity may be seen verbally, in a tendency to say what comes into their mind without necessarily considering the timing or appropriateness of the remark. This may create difficulties in personal and professional interactions. Impulsivity may also be seen in a tendency to spend money, change plans, and enact new schemes at short notice. These difficulties may not be apparent to the person with ADHD himself, but may cause great problems for family members and co-workers.

Many adults with ADHD suffer because of poor memory. Many come to rely on aids such as writing everything down and placing reminders all over their homes and workplaces.

Another common area of difficulty is in self-appraisal. Adults with ADHD are often inaccurate in their self-observation. They may have little idea of the impact that they are having on other people. This does

not mean that they lack concern; they often tend to worry needlessly about things. Many complain about a sense of impending doom or insecurity. Mood swings are also common.

Problems with self-esteem (see Chapter 7) may persist into adulthood. Many of the comorbid emotional disorders also persist, and some degree of depression is, therefore, common in adults with residual ADHD.

In some adults with residual ADHD, risk-taking behaviour is a problem. Such individuals search for high stimulation. In some cases, this may be found in activities such as sport or public life. There is also a tendency towards addictive behaviour, such as substance abuse, and activities such as gambling.

Insomnia is another common problem in individuals with residual ADHD. It may take the form of difficulty falling asleep (sleep-onset insomnia), difficulty staying asleep (nocturnal waking), or difficulty waking in the morning. A problem falling asleep at night combined with difficulty waking in the morning is often due to a shift in the internal body clock, a condition known as *delayed sleep phase syndrome* (DSPS). It is common in residual ADHD and responds well to treatment with melatonin.

It can be seen that adults with ADHD are 'high-risk' individuals. Many of their attributes may cause them to be extremely successful and to become 'high flyers'. However, they are also in danger of experiencing problems in personal relationships and with their financial affairs.

## How is the diagnosis of residual ADHD made?

Many of the characteristics of residual ADHD are seen in normal adults. Everyone can be, to some extent, distractible, restless, and impulsive. The diagnosis of residual ADHD depends upon the duration and intensity of these problems, as well as the characteristic clustering of features.

The diagnosis may then be confirmed by psychometric and other testing similar to that carried out in children with suspected ADHD.

ADHD always starts in childhood. It is, therefore, a prerequisite for the diagnosis that the characteristics have been present throughout the person's life. In some cases, the diagnosis of ADHD will already have been made during childhood, but sometimes the diagnosis is first made in adulthood.

If it is clear that a child with ADHD will continue to have problems during adulthood, the paediatrician who looks after him will refer him to

a psychiatrist once the child reaches adulthood (as described later, some paediatricians continue to treat individuals who were in their care into early adulthood). An adult who thinks he may have ADHD should request that his general practitioner refer him to a psychiatrist for an assessment.

Certain psychiatrists have a particular interest in residual ADHD and, therefore, have experience and expertise in this area. They may work in conjunction with psychologists who carry out standardized testing to evaluate the individual's particular strengths and weaknesses.

It is important that the psychiatrist excludes other conditions that may mimic ADHD. Problems such as depression (sadness, low self-esteem, withdrawn behaviour), mania (euphoria, overactivity, risk-taking), and obsessive–compulsive disorder need to be excluded. Some of these are similar to ADHD, but the treatment is different.

## Treatment of residual ADHD

Individuals with residual ADHD often have difficulties in a number of areas of their lives. Gaining insight into their problem makes a big difference to their ability to cope with these difficulties. Understanding that the problems arise from ADHD often makes it easier for the individual's partner and other members of the family to cope. The first step in treatment, therefore, is a proper explanation of the nature of residual ADHD and how it affects the person's functioning.

Some adults with ADHD require nothing more than this kind of explanation. However, many will need help in the form of medication and/or counselling.

Medication plays a vital role in helping a person with residual ADHD. The adult brain responds just as well as the child's brain to medications used for ADHD. Often the doses needed during adulthood are proportionately smaller than those needed for children. For example, an adult may need to take no more Ritalin or dexamphetamine per day than a primary school child, despite being considerably heavier.

An adult will need to administer the medication himself, and so issues relating to abuse of these medicines must be understood. With proper controls over the dispensing of medicines like Ritalin and dexamphetamine, problems with dependence should not occur. The doses of these medicines used in ADHD are extremely small, and do not result in any change in mood that would encourage dependence.

All of the medicines used for children with ADHD can be used in adulthood. Antidepressant medication may be very useful in adults with ADHD who also have depression.

Individual or group therapy can also be helpful for adults with ADHD. In many cases, family therapy or marital guidance will also be helpful. Adults with ADHD commonly need help in finding ways of resolving inter-personal conflicts and in addressing marital, family, and occupational problems. Methods for anger control, treatment of addiction, improving self-esteem, and refining inter-personal skills are helpful.

Because of the organizational difficulties experienced by adults with residual ADHD, the teaching of time management and self-organizational skills is also helpful. Cognitive therapy, where the adult learns how to control thought patterns, is successful in well-motivated adults with ADHD. Social problem-solving and stress reduction can be taught through counselling and role-playing. Group meetings can be helpful, and also provide mutual support and an opportunity to exchange ideas on managing common problems.

## Treatment of secondary problems

Many adults with residual ADHD have problems with basic academic skills that date from their school days. These may be present even if the ADHD difficulties have resolved. There are many ways in which an adult with such difficulties can take steps to overcome them.

If an adult with ADHD is undertaking further training, he should inform his lecturers or teachers about his condition, in order that allowances can be made for his difficulties. Most tertiary education centres have special provisions for the enrolment of people with a disability and adults with ADHD often qualify for these.

It is important to use the aids that are available. If attending lectures, a recording device can be used. If difficulties are experienced in taking notes, a friend may be prepared to make a photocopy of his or her notes. A computer program may be used to check spelling. A computer can be used to help produce work that is legible and well presented. For those who are better at typing than writing, digital diaries are useful. Calculators have made arithmetic calculations easy for everyone. Spellchecker programmes and spelling dictionaries are helpful for adults who have spelling difficulties.

For those who have to take examinations, it is usually possible to arrange for allowances to be made for difficulties with reading or

writing. It may be necessary to obtain a letter from a doctor or psychologist to obtain permission to have extra time, rest breaks and/or to use aids such as a computer, reader, or scribe for examinations. It may also be possible to be granted extra time to complete assignments.

Those who continue to have difficulties with reading may benefit from audiobooks, which are available from many libraries. Some libraries have books written for adults that are easy to read.

Adults who have difficulty with reading or writing should not be embarrassed to ask others to fill in forms for them. Many adults with good literacy skills experience difficulty with forms. Similarly, when taking messages, there is no reason to be embarrassed about asking to have things repeated or spelled out.

## Transition to adult services

In the past, because of the underdiagnosis of childhood ADHD, most adults with ADHD received their diagnosis for the first time in adulthood. Now, due to greater awareness of childhood ADHD, the situation has changed. There are now large numbers of children, already diagnosed with ADHD, entering adulthood. A proportion of these individuals either have not grown out of the condition or have persisting secondary problems as a result of their ADHD. It is essential that such individuals are able to transition from child to adult services with the minimum amount of disruption.

## The problem

Unfortunately, this transition often does not occur. Studies in a number of countries have shown that many children with ADHD, who require ongoing management of their condition as they grow into adulthood, fail to receive treatment as adults. Such individuals are said to have been ‘lost in transition’ when they enter adulthood. As a result, they often experience significant difficulty in their tertiary studies, the workforce, and their relationships with others. Some drop out of courses or employment, are asked to leave work placements, or suffer emotional difficulties. Some develop behaviours such as gambling and substance abuse, and a number get into trouble with the law. Once these problems arise, it is difficult to put things right again.

## The barriers to transition

The reasons for being lost in transition relate partially to the changes that occur in the individuals themselves as they enter early adulthood, and partly due to the nature of adult services.

## The young adult

As they grow into early adulthood, many individuals with ADHD reject the idea that there is anything wrong with them. They want to control their own lives, but often lack the insight to understand the cause of the difficulties they face. To make matters worse, they are frequently reluctant to seek help when things go wrong, or they may seek help in the wrong places. In addition, they are exposed to many temptations that come with greater independence. Their newfound freedom to control their own activities, and to not be answerable to their parents, can lead to experimentation and risk taking. Their lives often become disorganized, with late nights and daytime hours wasted in sleeping, socializing, and playing computer games. Alcohol, legally available to them for the first time, can be abused, and the fact that they are at an age when they can start driving makes this even more hazardous. Furthermore, unlike the more nurturing school system, when things do go wrong, tertiary education centres and workplace employers are often reluctant to give young adults with ADHD a second chance.

## The adult services

To add to the difficulties, adult services are different to those for children in ways that can discourage transition to them. While children with ADHD are usually treated by a paediatrician, adults generally need to see a psychiatrist. To some young adults there is a stigma associated with seeing a psychiatrist. Many will complain that they do not have a mental disorder and dismiss psychiatrists with pejorative names like ‘shrink’.

While patients who see a paediatrician are usually accompanied by a parent who describes the child’s difficulties and institutes and supervises any treatment regime that is recommended, adult psychiatrists usually see their patients on their own. This may mean that the patient fails to disclose the problems he is facing, or to follow up on recommended treatment and reviews.

Parents may expect their young adult child to begin to contribute to the expense of services, which adds a further disincentive to accessing such services. If young adults live away from home, for example in residential colleges or in shared accommodation, the absence of

parental influence and assistance acts as a further barrier to service access. In these situations, the influence of peers, even if well-meaning, can be counterproductive.

## Strategies to facilitate transition

If the transition from childhood to adulthood—a period of great vulnerability for those who have not grown out of their difficulties—can be successfully negotiated, individuals with ADHD can go on to be highly successful adults. It is therefore imperative to try to facilitate transition to adult services.

One solution is for paediatricians to continue to care for their patients beyond adolescence. This means that the young adult continues to see the same doctor with whom he is used to consulting. For young adults, seeing a paediatrician generally does not have the same negative associations that seeing a psychiatrist has. In addition, many young adults feel comfortable continuing to involve their parents in the contact with their paediatrician, as they have become used to this arrangement during their childhood.

Fortunately, some developmental paediatricians have already discovered that discharging children with ADHD when they reach 16 or 18 years of age does not work well for these individuals. At this age, the adolescent is often in the last crucial years of schooling and at the challenging commencement of tertiary studies or entry into the work force. This is not a good time to change specialists. Many paediatricians continue to treat their patients until they reach the age of 25 years.

If the paediatrician continues to manage the young adult, it is essential that he or she has the appropriate training and qualifications to treat young adults. It is important that the waiting room and office of such paediatricians are designed in such a way that a young adult does not feel that he is being treated like a child. It is also important that the paediatrician is aware that the young adult patient will need to have his condition and treatment explained again, because he will have a greater ability to understand concepts and will often have many questions.

At whatever age transition to adult services occurs, the paediatrician has a role in preparing his or her patients well in advance to facilitate the transition to an adult service. He or she needs to explain why transition is necessary, the nature of the psychiatrist's role, and how and when the transition will occur. The paediatrician will also need to be involved in facilitating the making of an appointment with a

psychiatrist and ensuring that the psychiatrist has copies of the patient's medical records.

Psychiatrists who treat young adults with ADHD need to be open to involving parents if their patient gives permission for them to do so. Parents, in turn, need to be aware that, although their child with ADHD has reached adulthood, he may still require more support than they might expect of a young adult. Of course, parents of young adults can only support their adult child with ADHD if he permits this.

If adolescents with ADHD are involved in management decisions that affect them, they will be more likely to let their parents remain involved when they reach adulthood. They will also have gained experience in making decisions, which will benefit them as adults.

SECTION 8

# Conclusion, Appendix, Index

# Conclusion

All parents want their children to be well adjusted emotionally, to be socially successful, and to fulfil their academic potential. Tragically, many intelligent children fail in one or more of these areas. Although there are several reasons why this may happen, many do so because they have ADHD.

The best management of ADHD is based on early and accurate diagnosis as outlined in this book. From this diagnostic process an individualized, multimodal treatment plan can be developed for each child with the condition.

There is no doubt that increasing numbers of children with ADHD are receiving appropriate diagnosis and treatment. But the task of ensuring that all children with this condition benefit from a modern approach to their difficulties is far from complete. To ensure that this occurs, a widespread change in attitudes to children with behavioural, learning, and emotional difficulties is needed. We need to move away from automatically blaming children and their families for children's learning and behavioural difficulties. We need to understand that the brain is the organ of learning, of self-esteem, of behaviour, and of emotion. We need to be open to the possibility that an inefficiency in brain function may be the cause of many children's difficulties. We need to treat ADHD with the same conviction that we presently treat conditions such as asthma and diabetes. With such changes, many more children will be able to look forward to a future of happiness and fulfilment.

# APPENDIX

## Useful internet sites

The internet contains a great deal of misinformation about ADHD. The following sites are generally reliable.

The ADD WareHouse is a useful site for those wanting to order articles, books, and assessment and training products.

http://www.addwarehouse.com

*Additude* magazine is an attractive and informative publication for those with ADHD and their families. This is the website of the magazine's publisher and it shares the magazine's positive tone.

http://www.additudemag.com

The attractive website of Verywell Mind contains reliable, compassionate information about mental health. It has a good section on ADHD.

http://www.verywellmind.com

CHADD (Children and Adults with ADHD) is a large American organization. Their website contains a great deal of reliable information about all aspects of ADHD. CHADD runs regular ADHD conferences in the USA. They also sell books and other merchandise.

http://www.chadd.org

The US organization ADDA (Attention Deficit Disorder Association) has an extensive website with reliable information. ADDA runs regular ADHD conferences in the USA.

http://www.add.org

The website of the UK organization ADDISS (The National Attention Deficit Disorder Information and Support Service) contains a great deal of information about conferences, support groups, and other resources in the UK. It also has an online bookstore.

http://www.addiss.co.uk

ADHD Europe aims to advance the rights and the dignity of all those affected by ADHD (and coexisting conditions) across Europe.

http://www.adhdeurope.eu

ADHD Australia is a registered national, independent, non-profit organization that aims to create positive public awareness and understanding of ADHD. The website provides information about the condition and about resources in Australia.

http://www.adhdaustralia.org.au

CADDAC (Centre for ADHD Awareness, Canada) is a Canadian national charitable organization dedicated to improving the lives of those with ADHD. The website provides information about the condition, as well as about resources in Canada.

http://www.caddac.ca/adhd

ADHD New Zealand provides information about the condition, and about resources in New Zealand.

http://www.adhd.org.nz

ADHASA (Attention Deficit and Hyperactivity Support Group of Southern Africa) aims to create awareness and provide support to those with ADHD and their families.

http://www.adhasa.co.za

# Index

*For the benefit of digital users, indexed terms that span two pages (e.g., 52–53) may, on occasion, appear on only one of those pages.*
Boxes are indicated by *b* following the page number

**C**